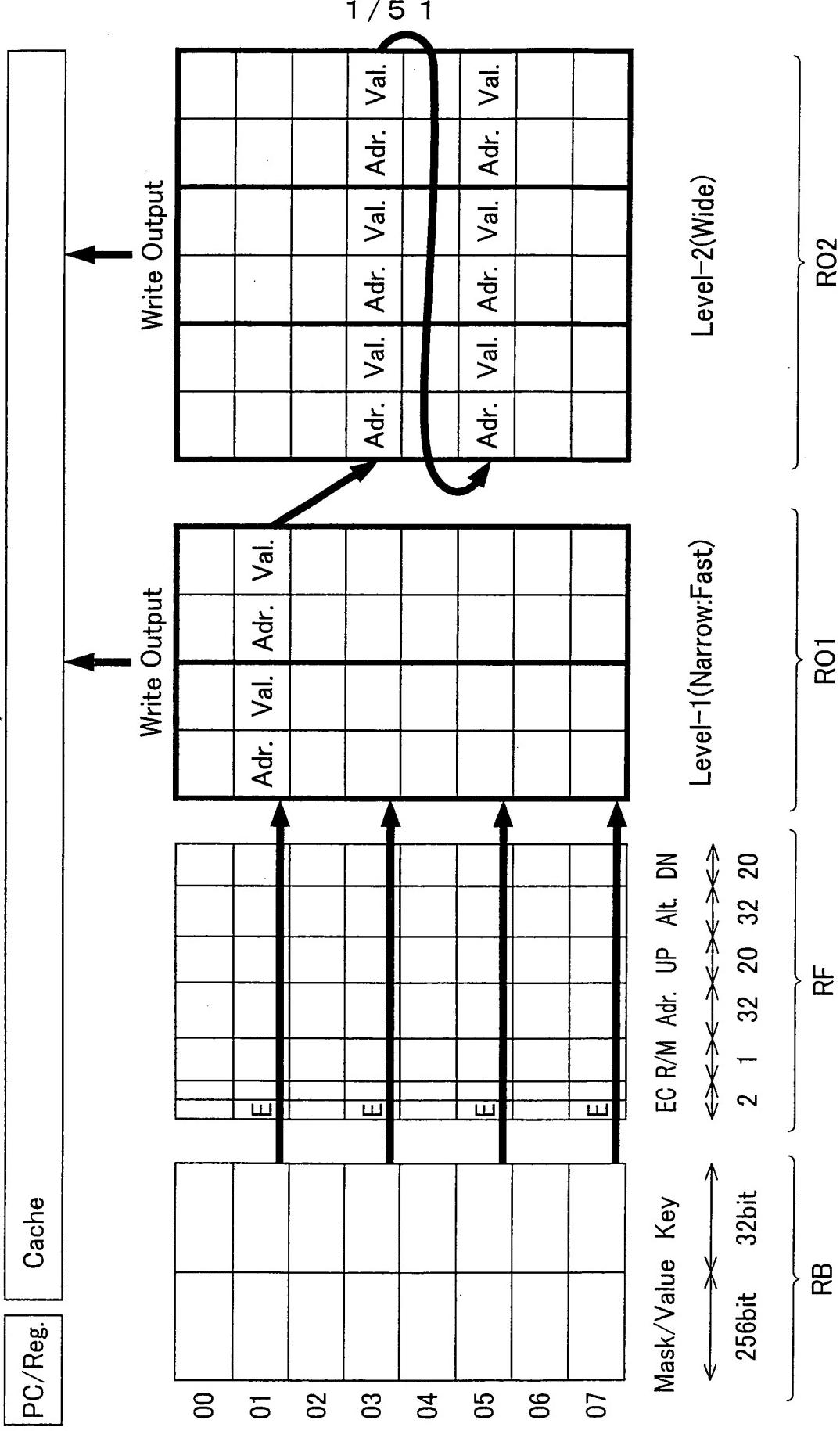


FIG. 1



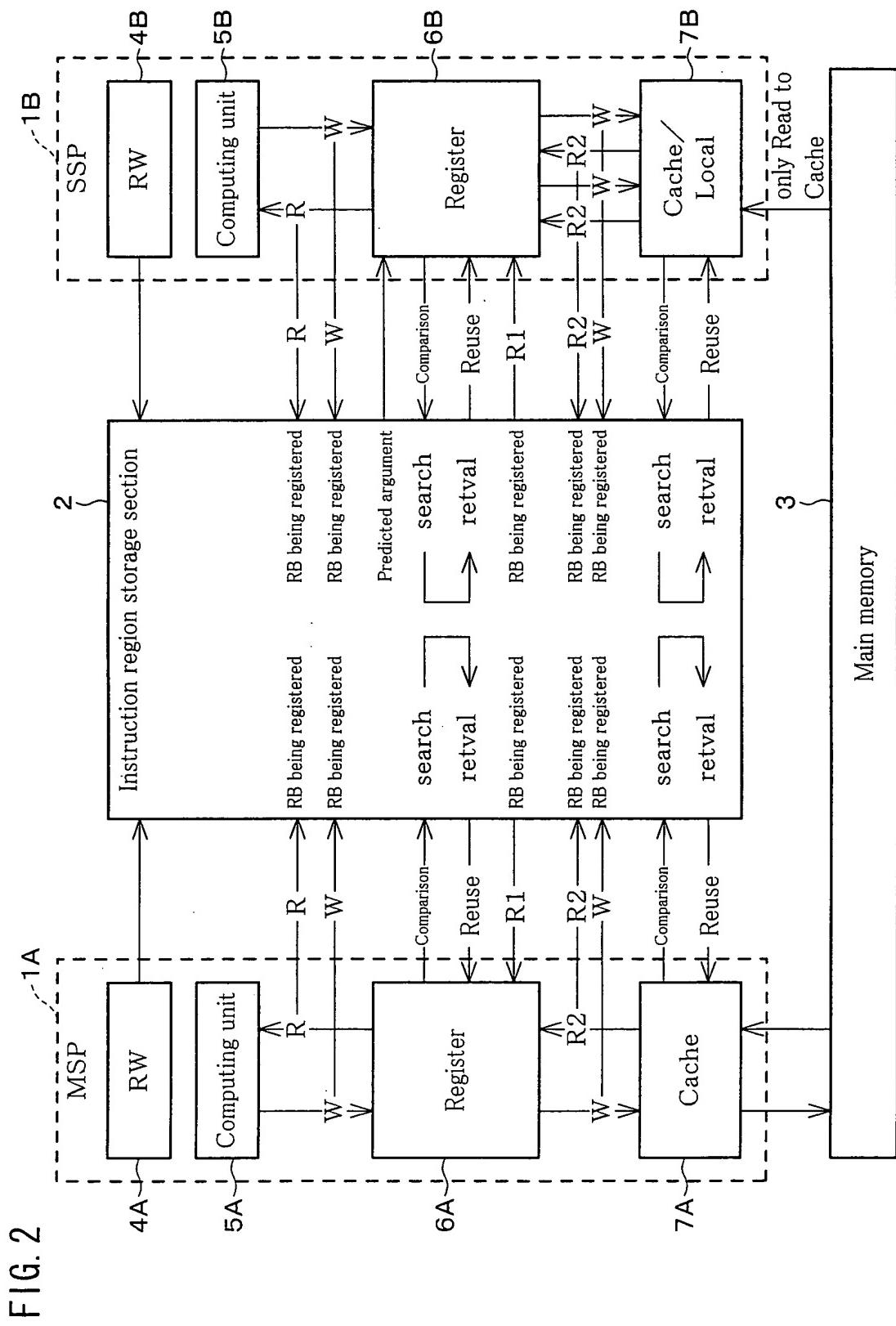
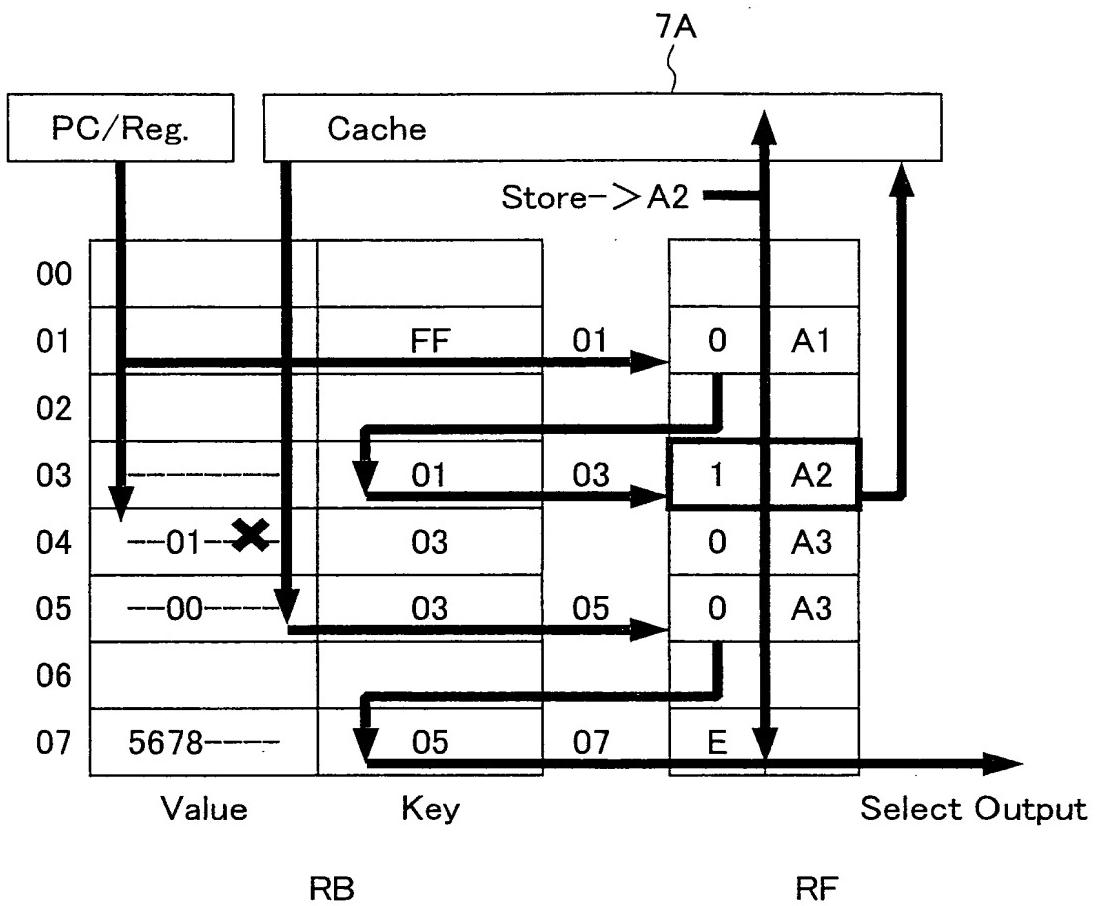


FIG. 3



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FIG. 4(a)

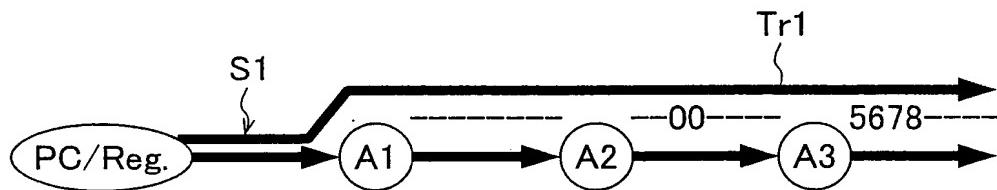
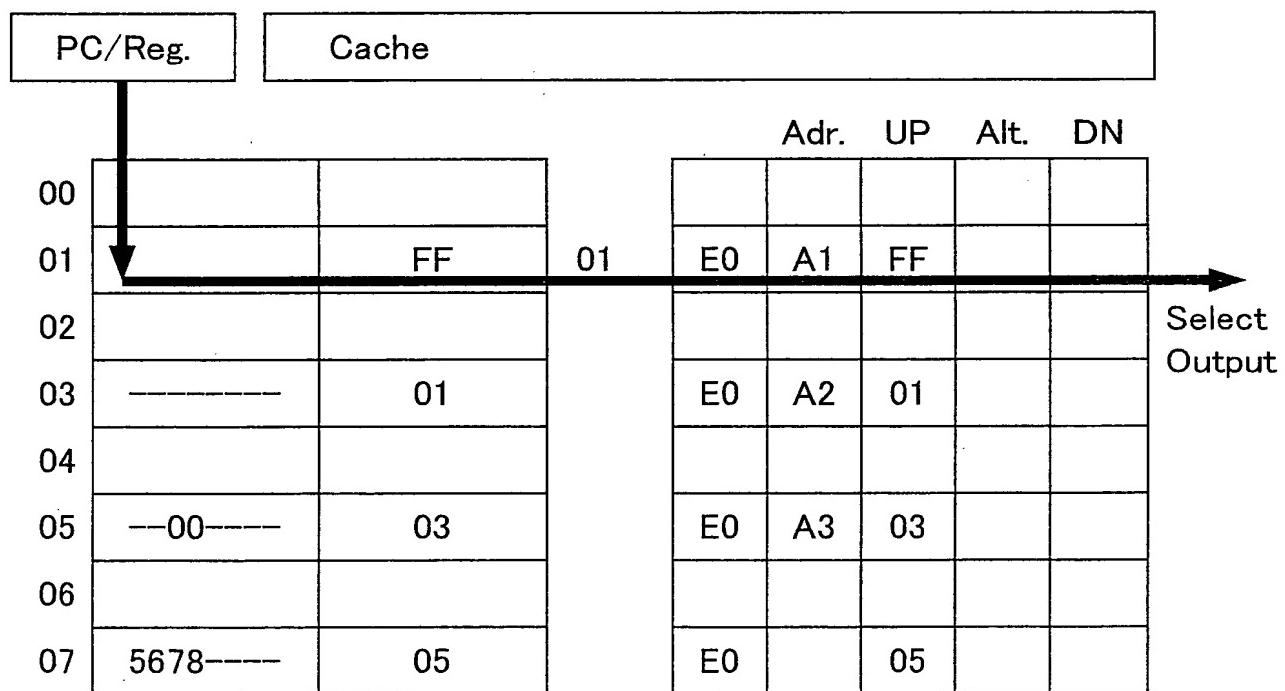


FIG. 4(b)



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FIG. 5 (a)

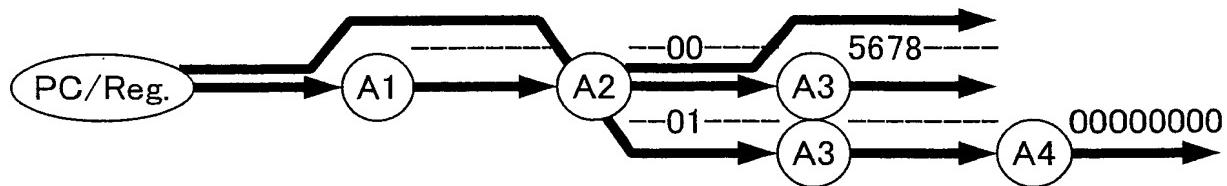
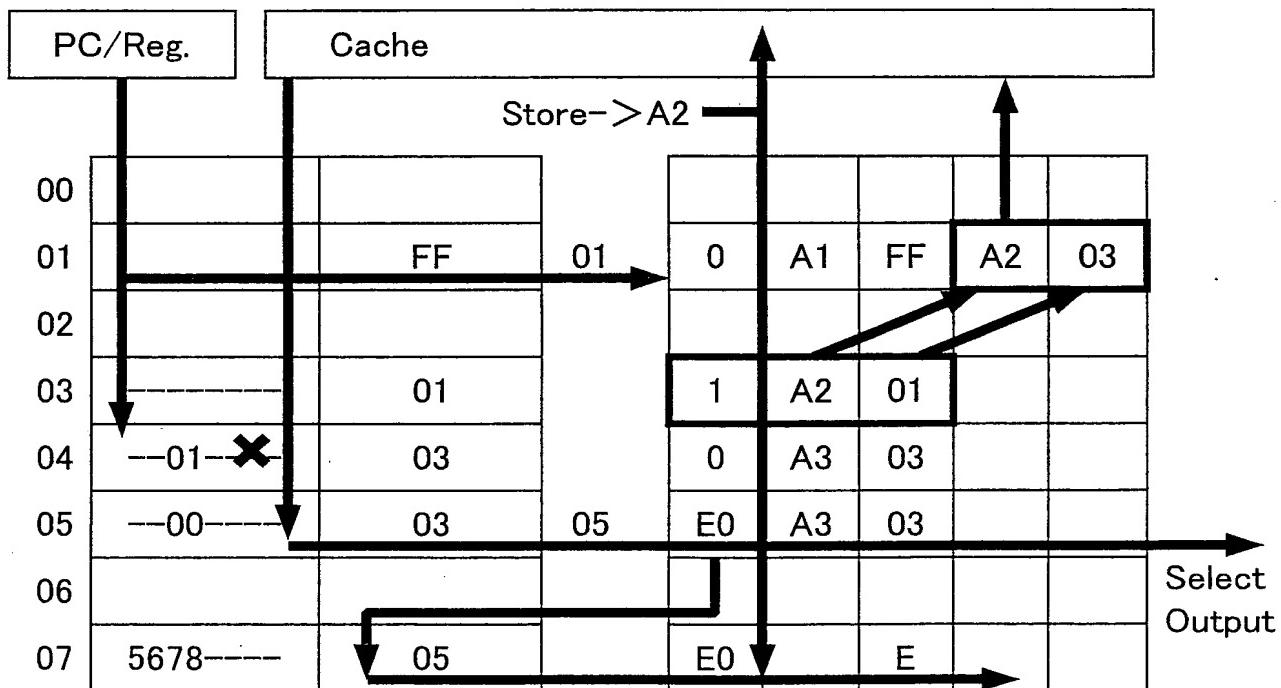


FIG. 5 (b)



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FIG. 6

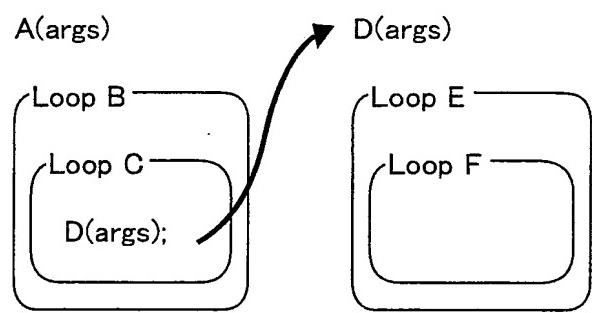


FIG. 7

Func. and Loop

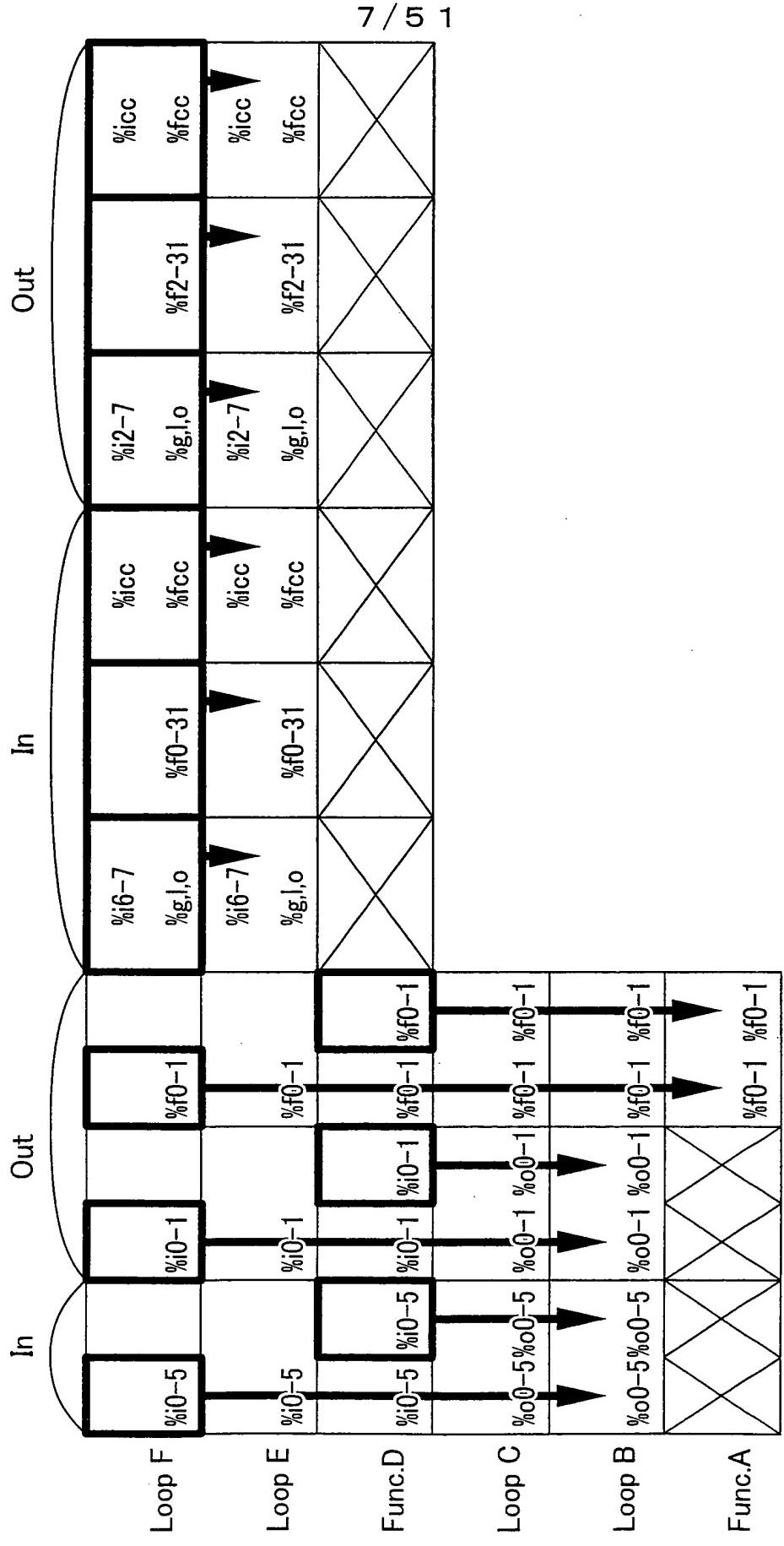


FIG. 8 (Pointer for Multilevel Memorization)

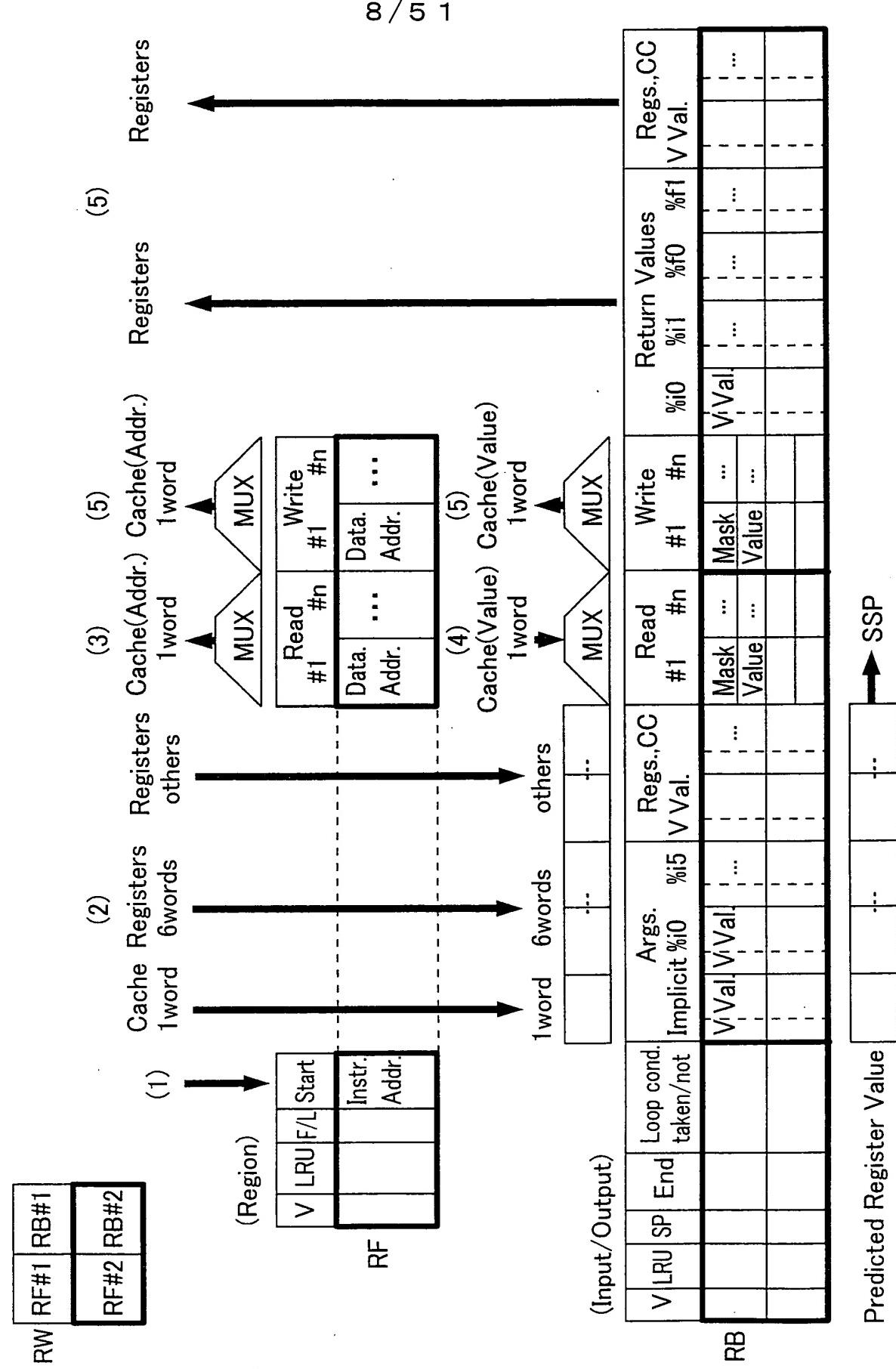


FIG. 9

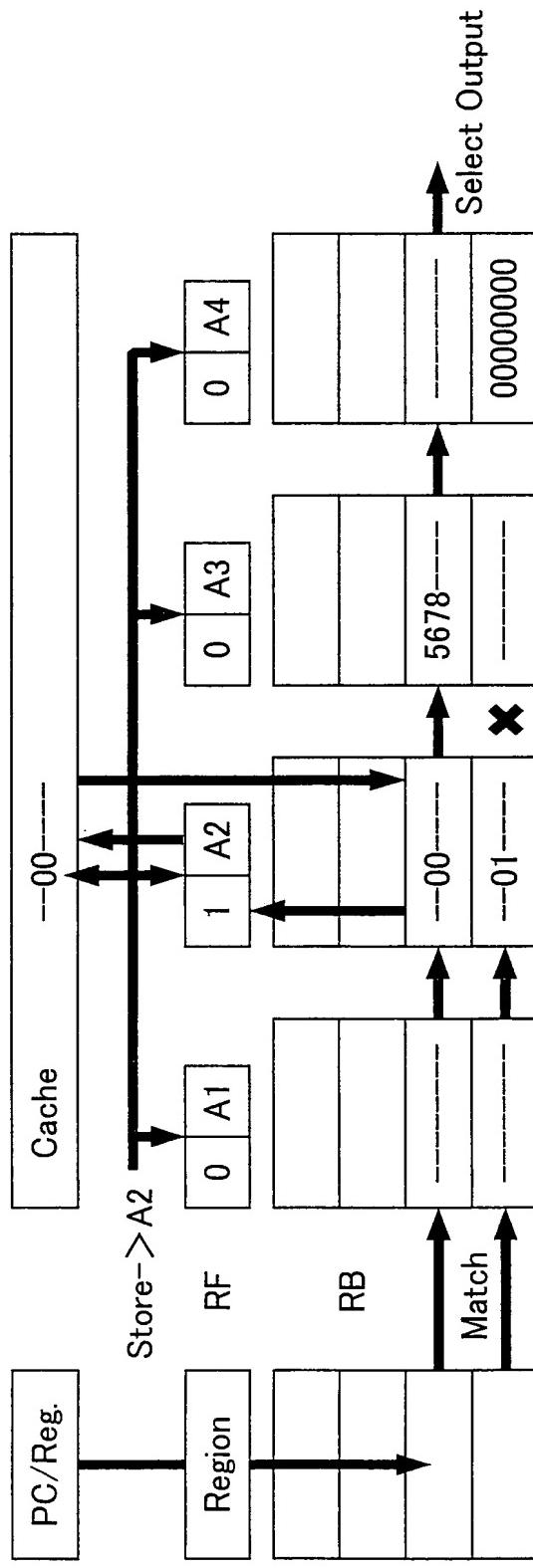


FIG. 10

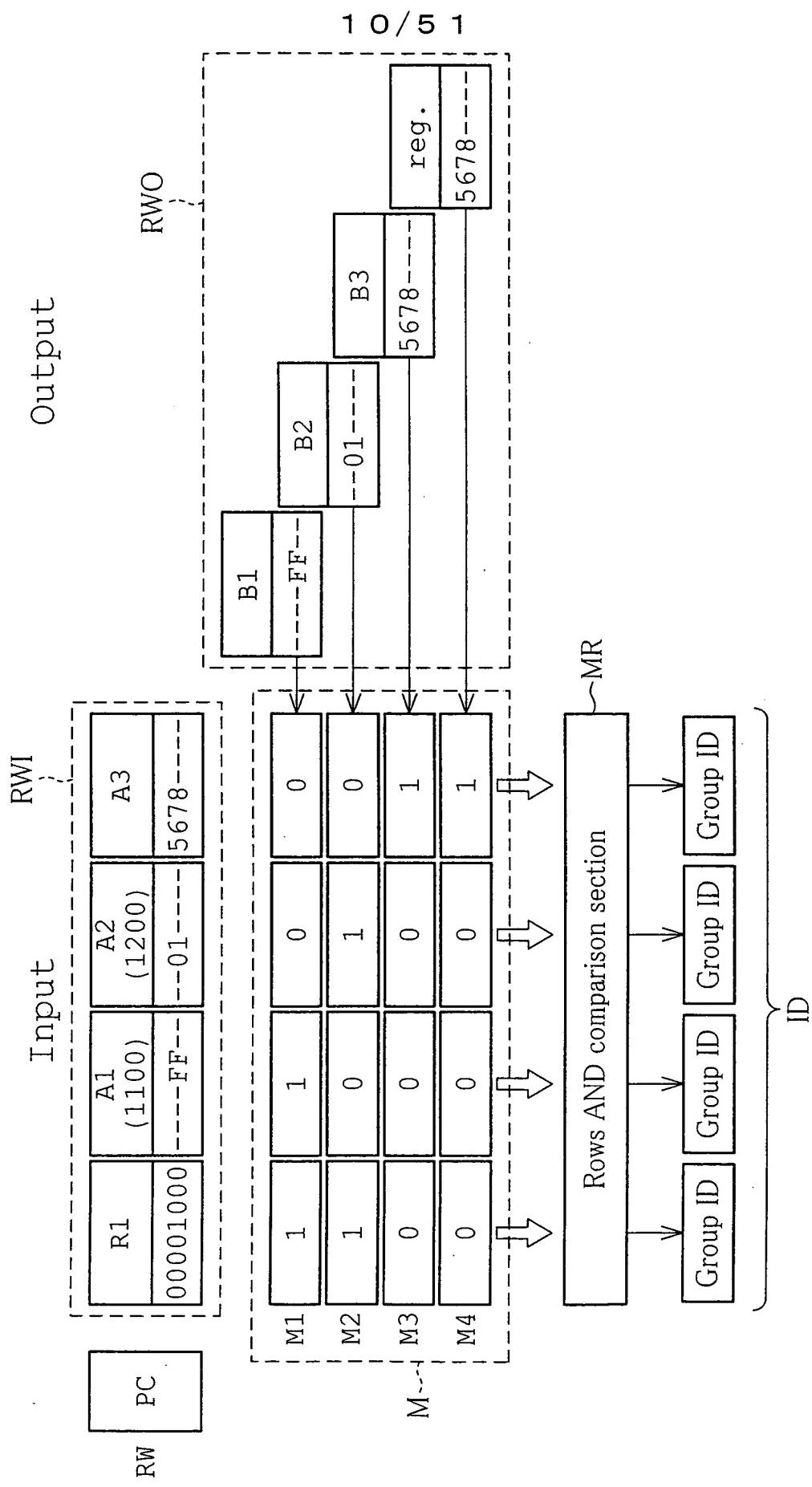
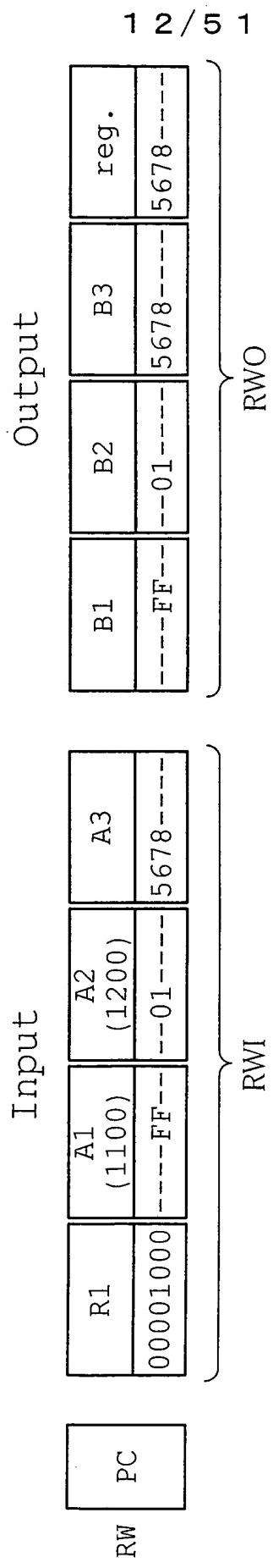


FIG.11

PC:load	[R1+100] (----FF--)	-> reg.
store	reg.	-> B1 (----FF--)
load	[R1+200] (--01----)	-> reg.
store	reg.	-> B2 (--01----)
load	A3(5678----	-> reg.
store	reg.	-> B3(5678----

FIG. 12



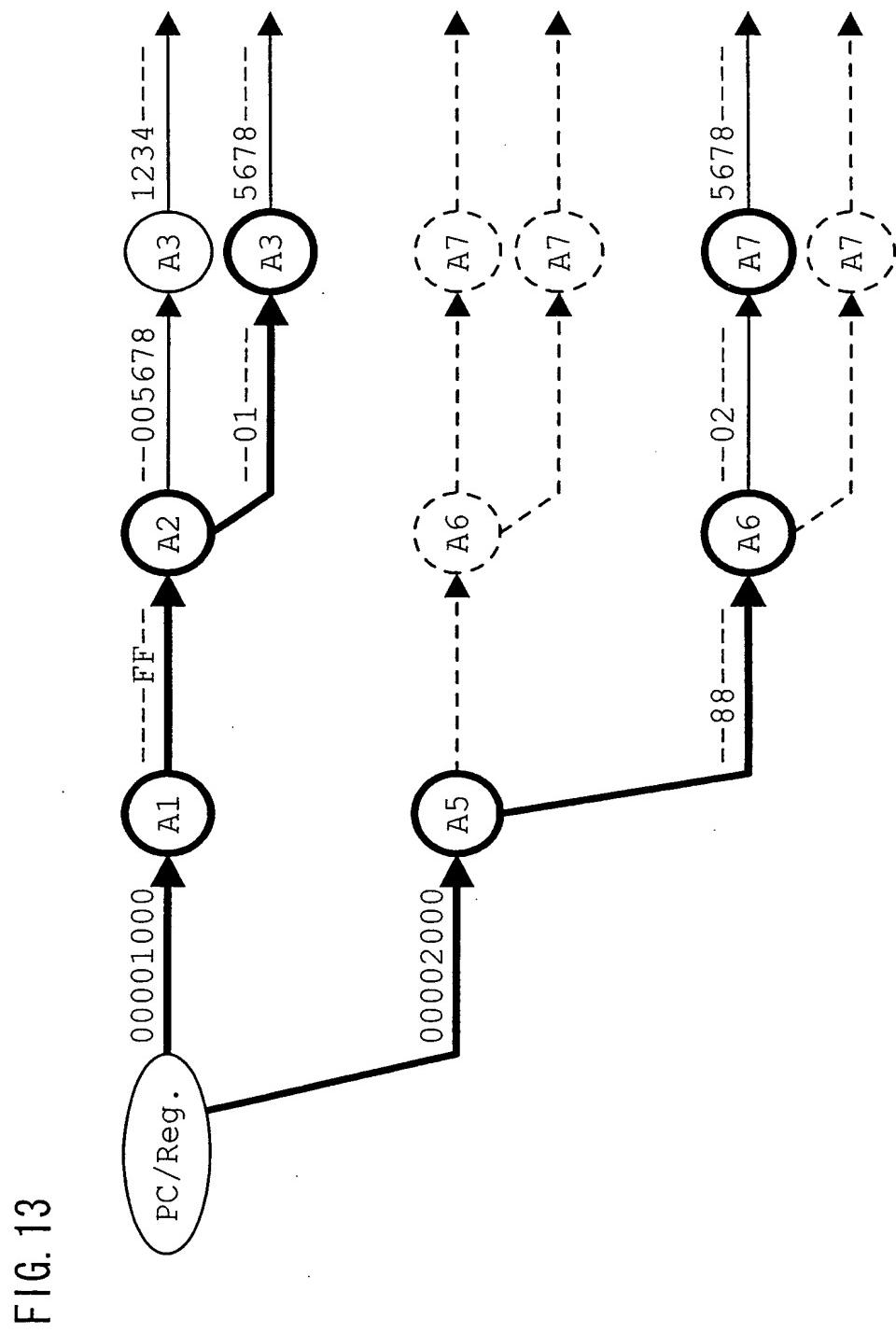


FIG. 14

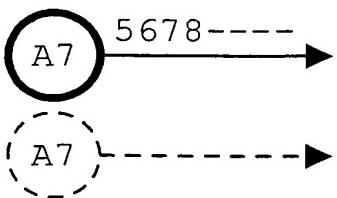
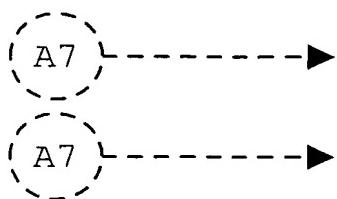
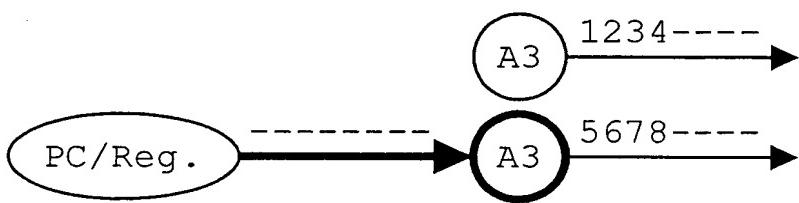
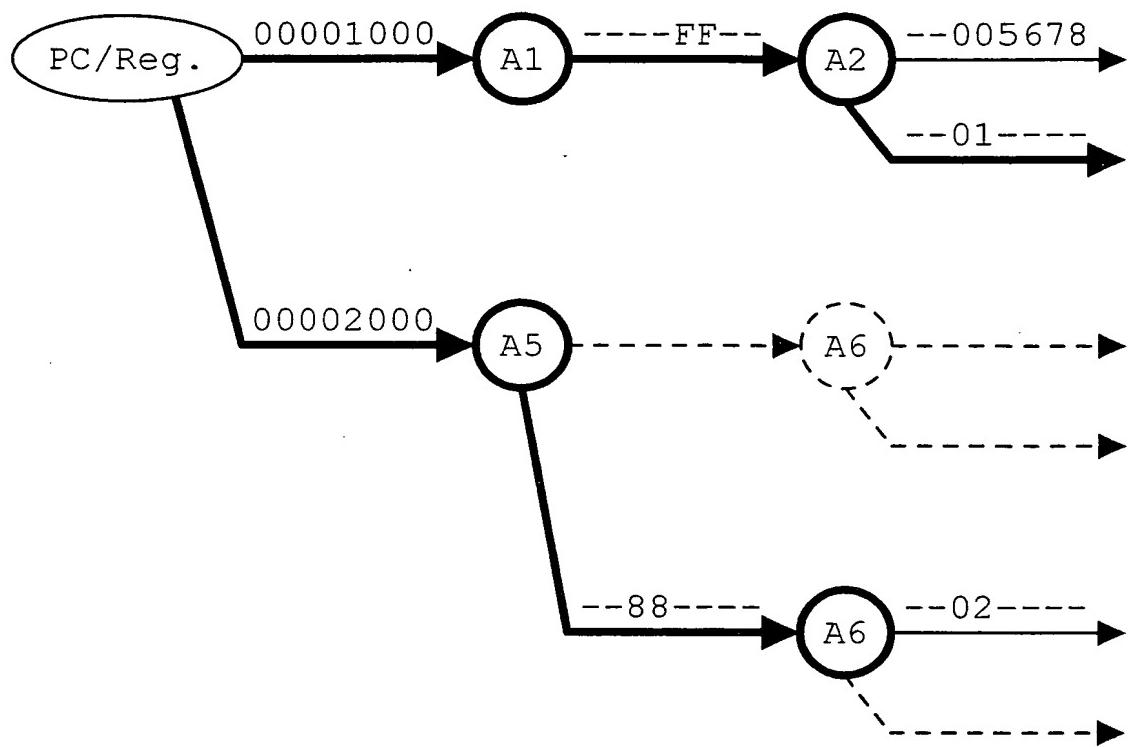


FIG. 15

PC:1000

Id(A1) → R1

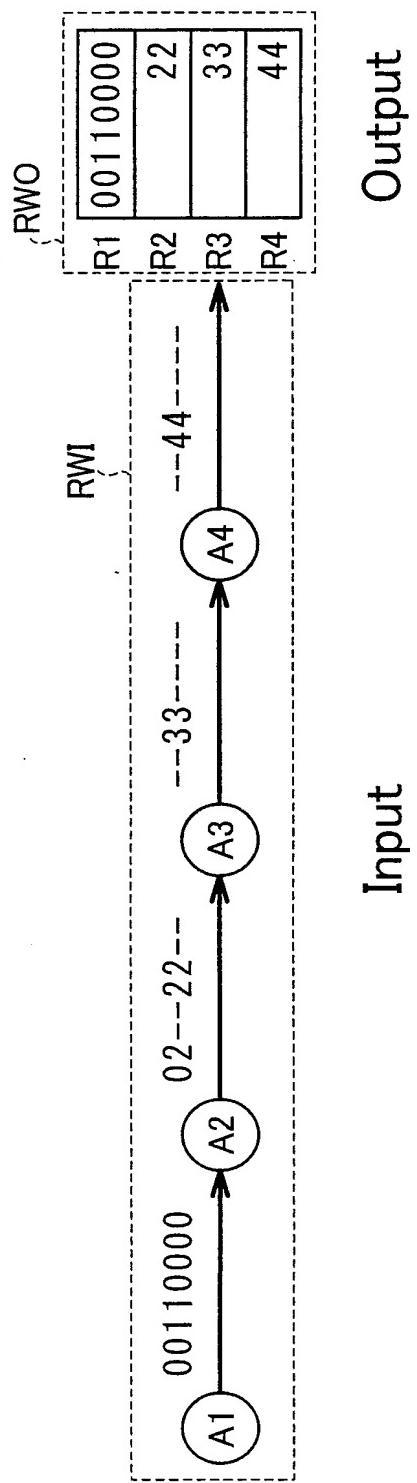
Id(A2) → R2

Id(A2+R2) → R2

Id(A3) → R3

Id(A4=R1+R2) → R4

FIG. 16



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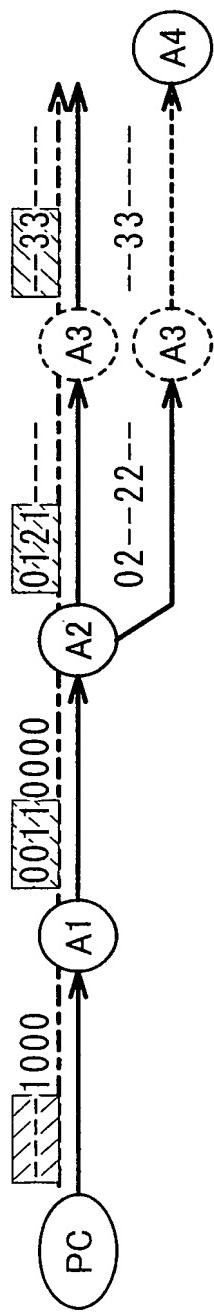


FIG. 17

FIG. 18

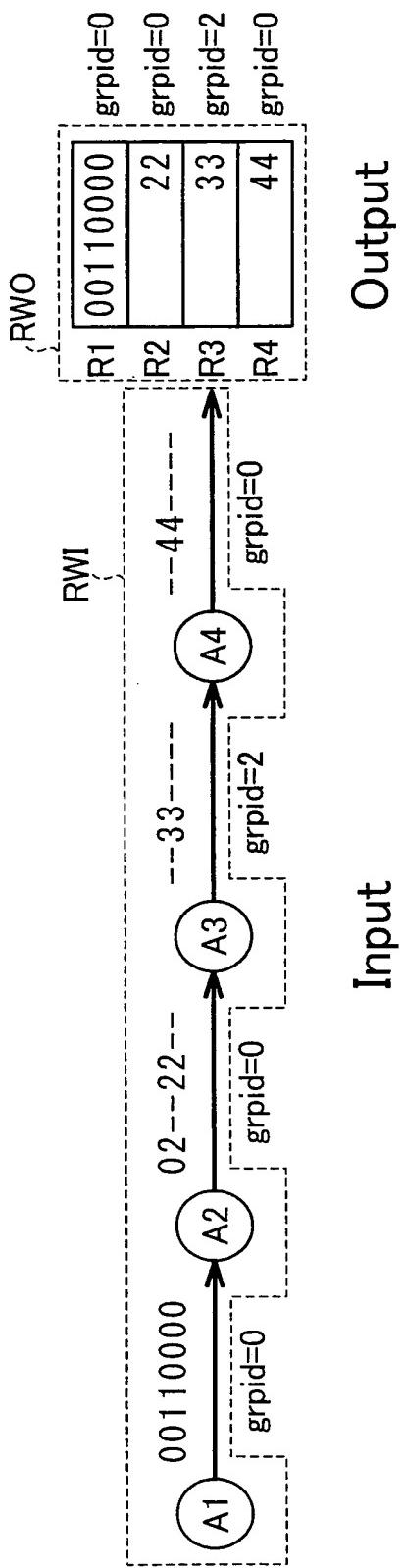


FIG. 19

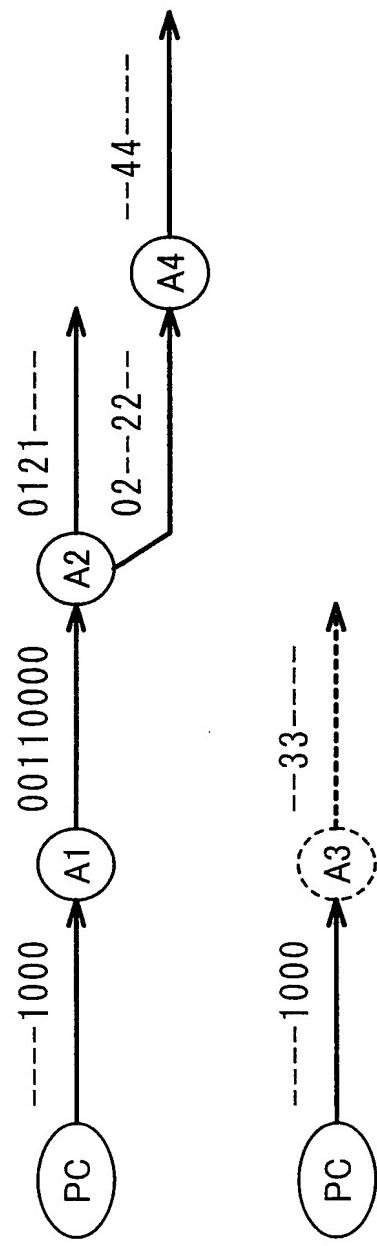


FIG. 20

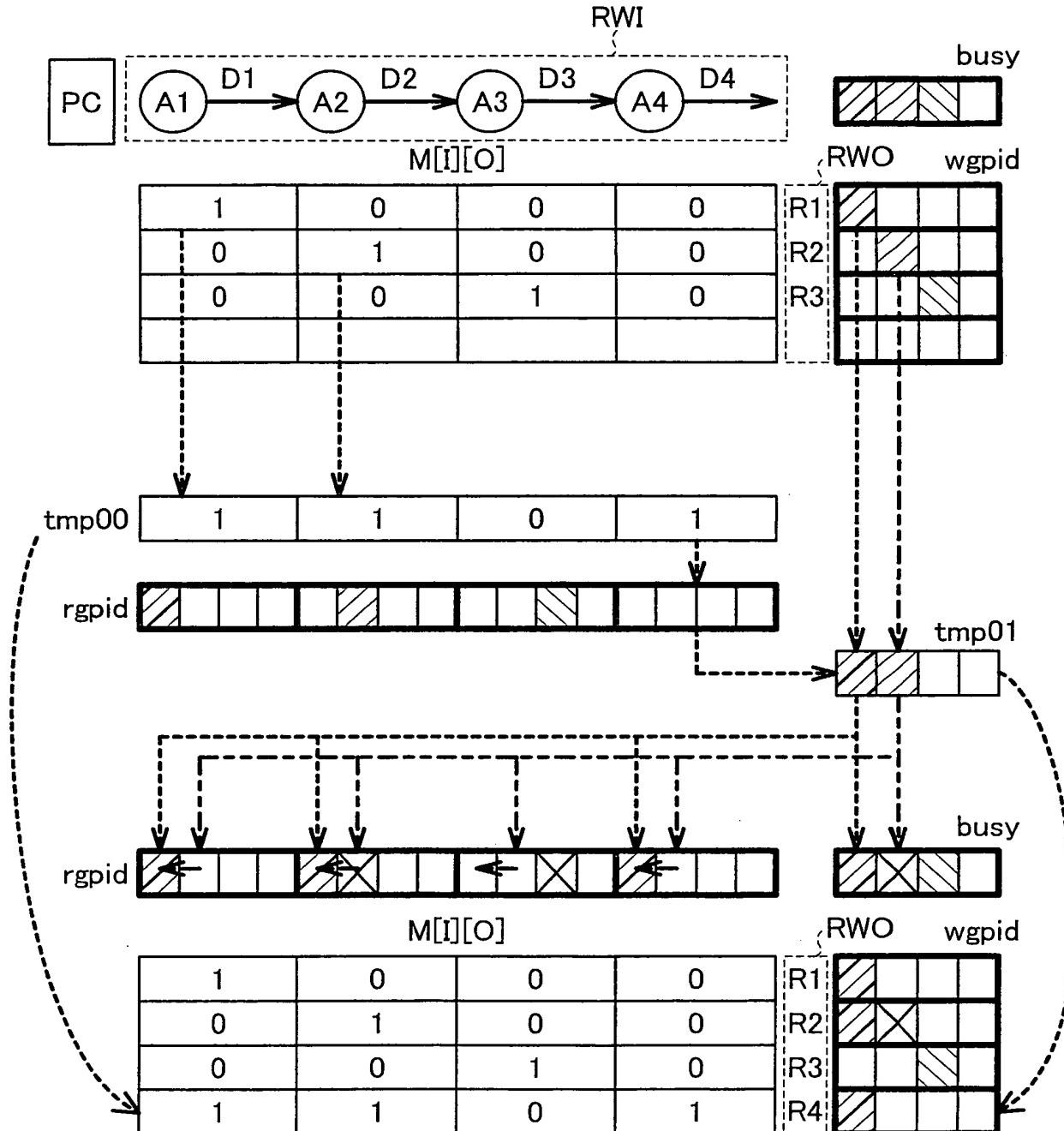
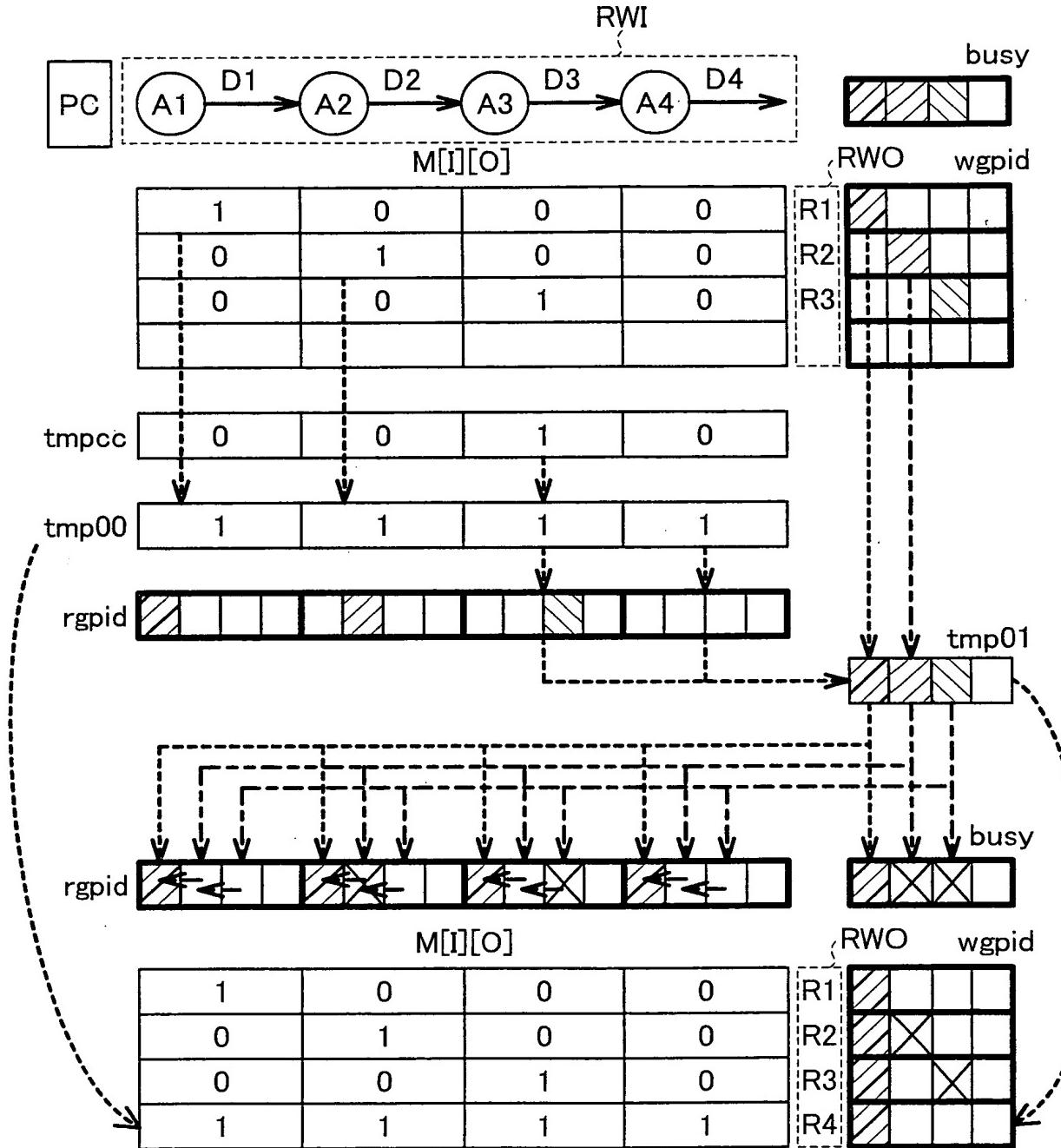


FIG. 21



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FIG. 22

Id(A1) → R1

Id(A2) → R2

Id(A2+R2) → R2

Id(A3) → R3

subcc R3

bz xxxx

Id(~~A4=R1+R2~~) → R4

FIG. 23

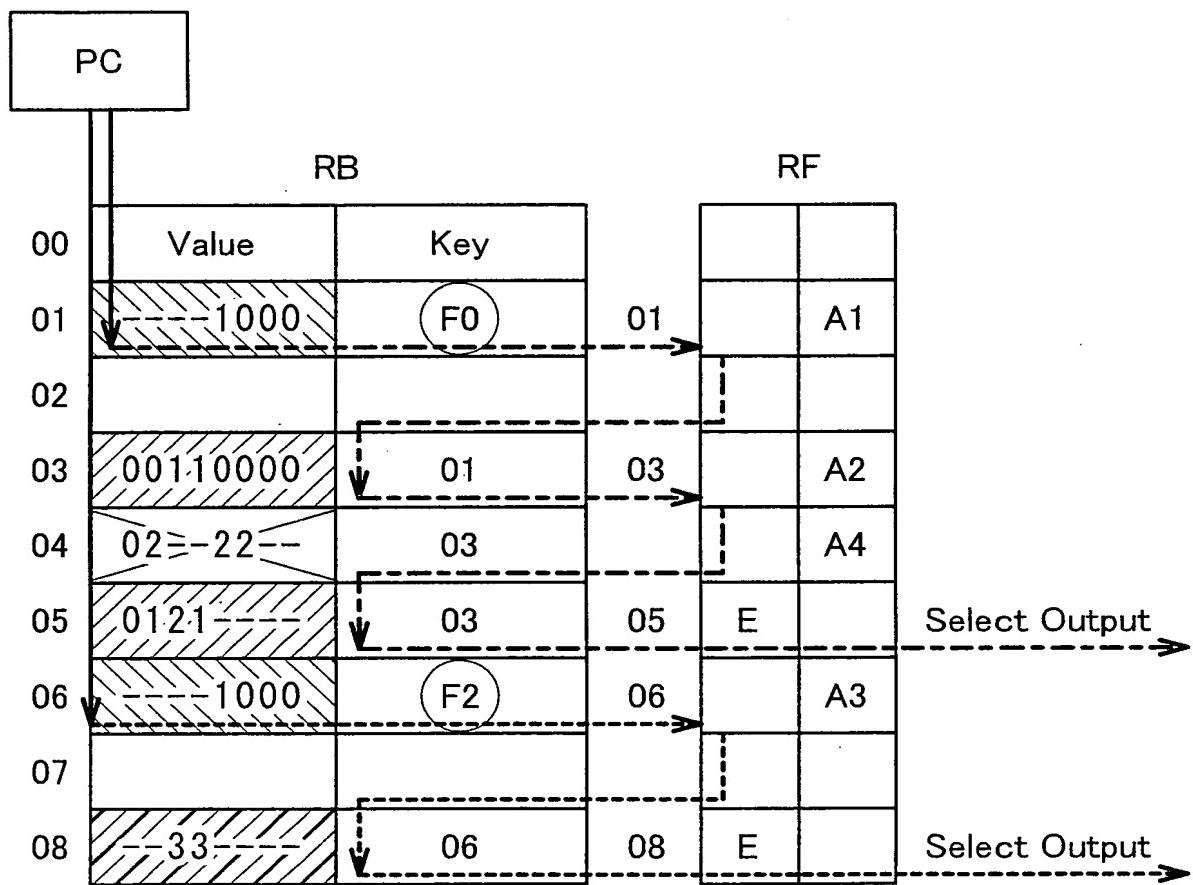
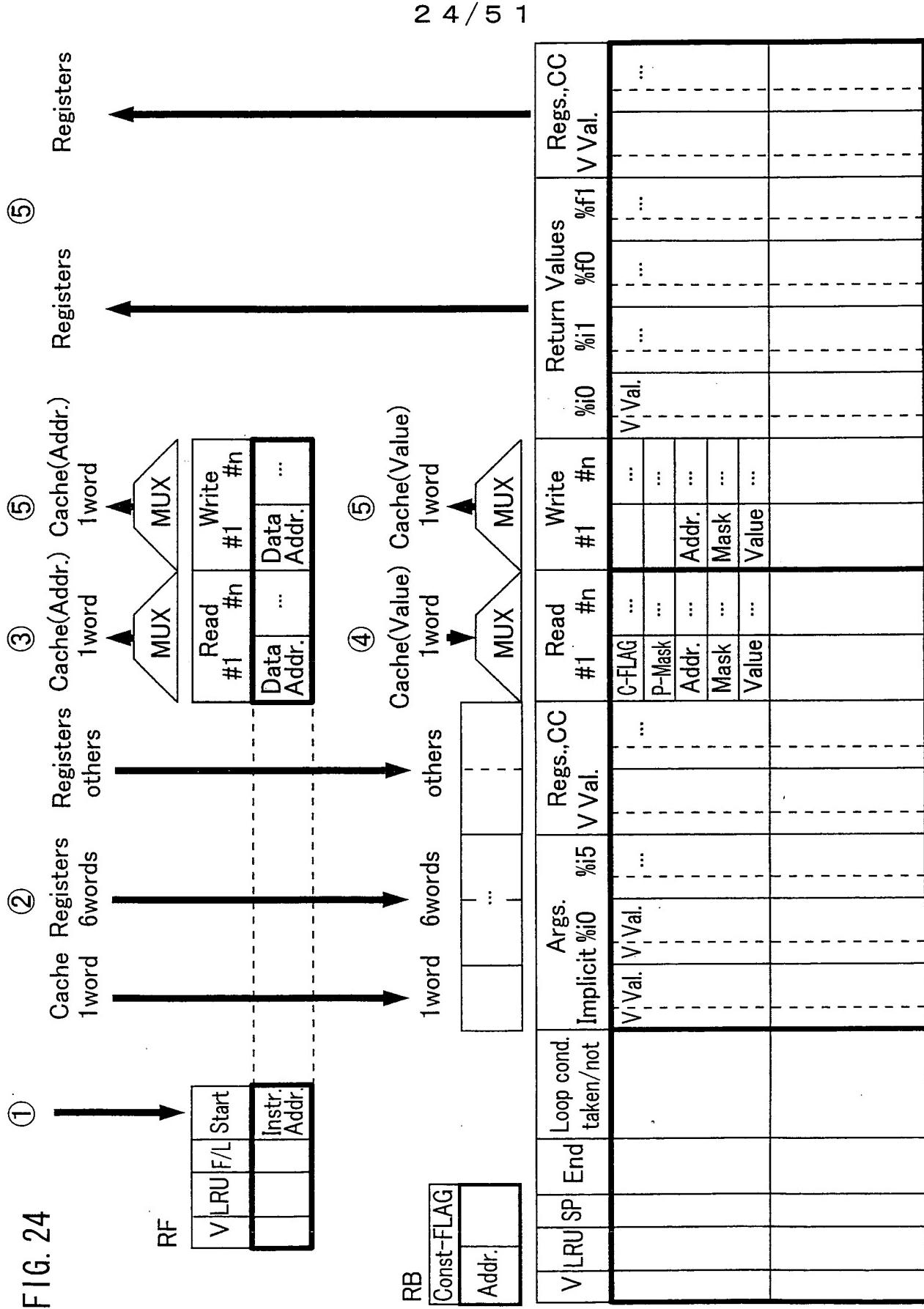


FIG. 24



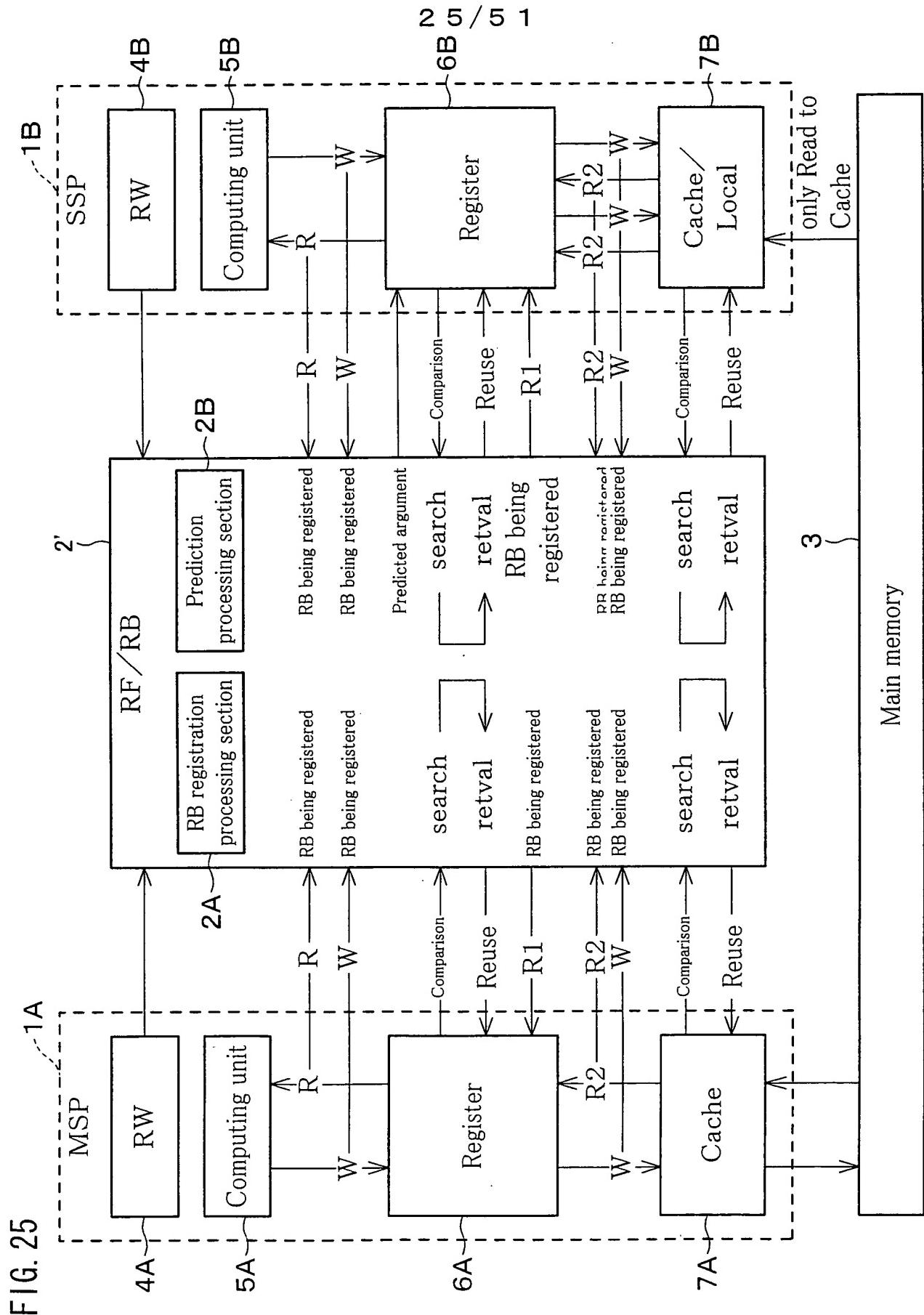


FIG. 26

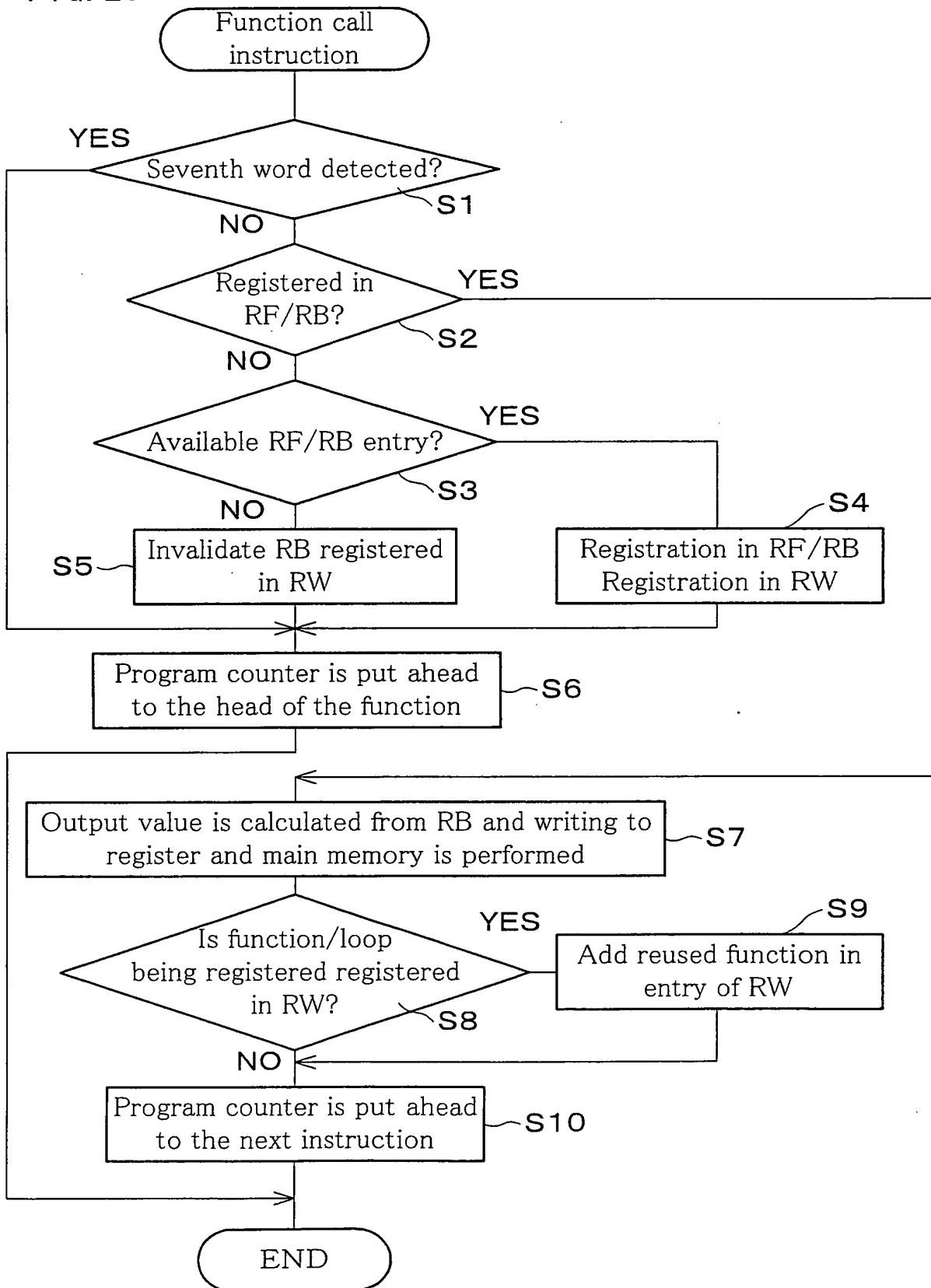


FIG. 27

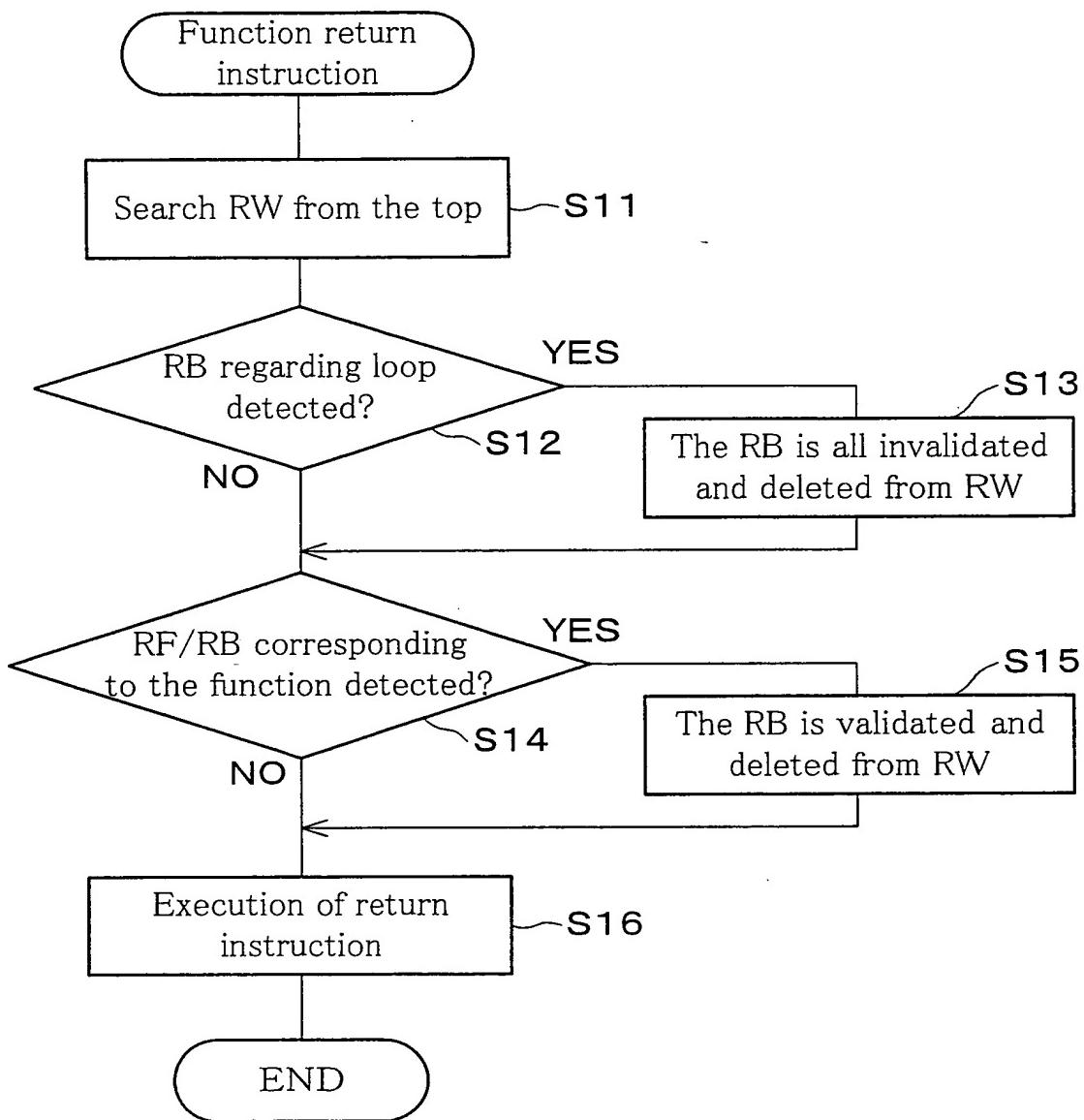


FIG. 28

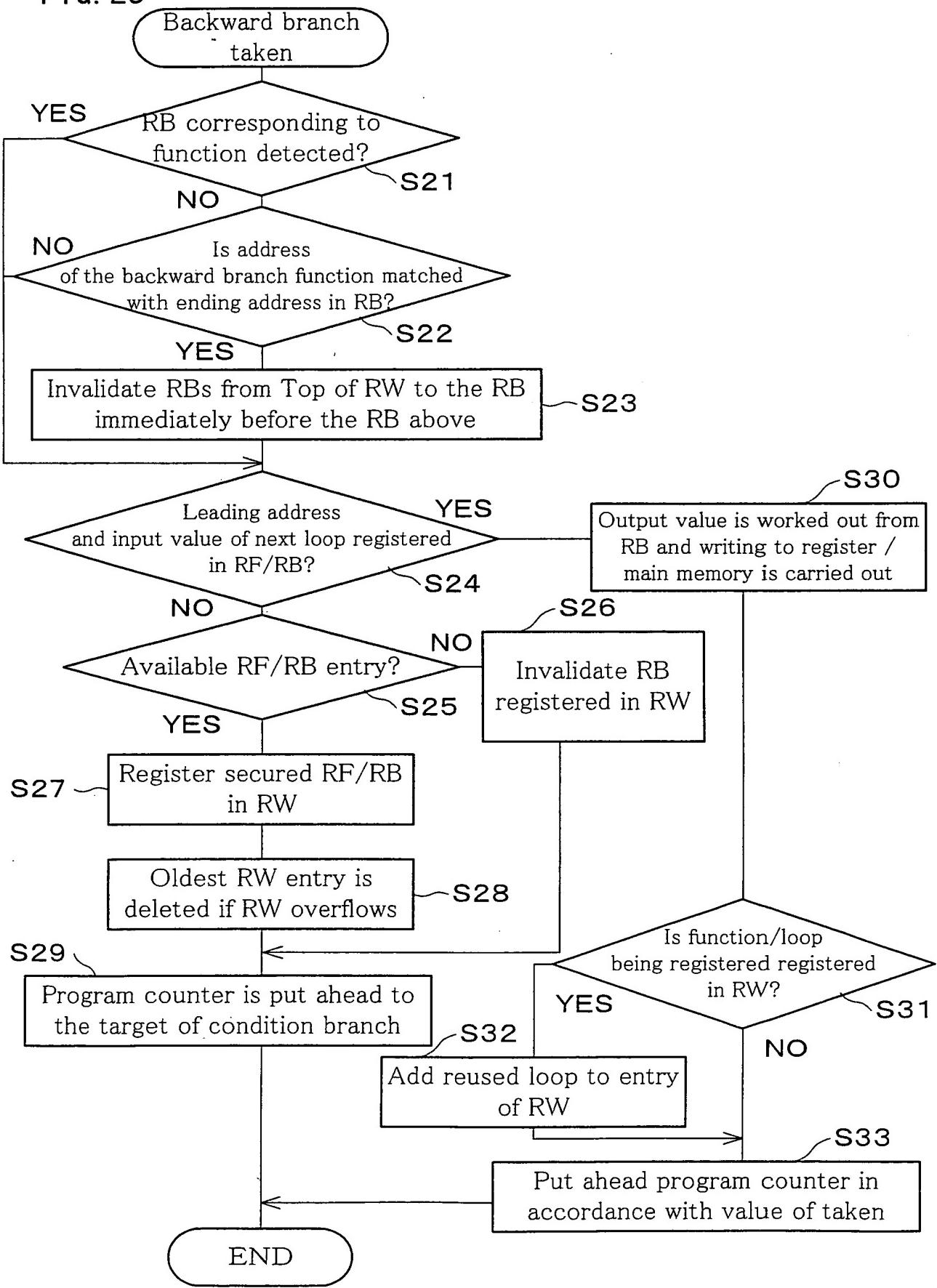
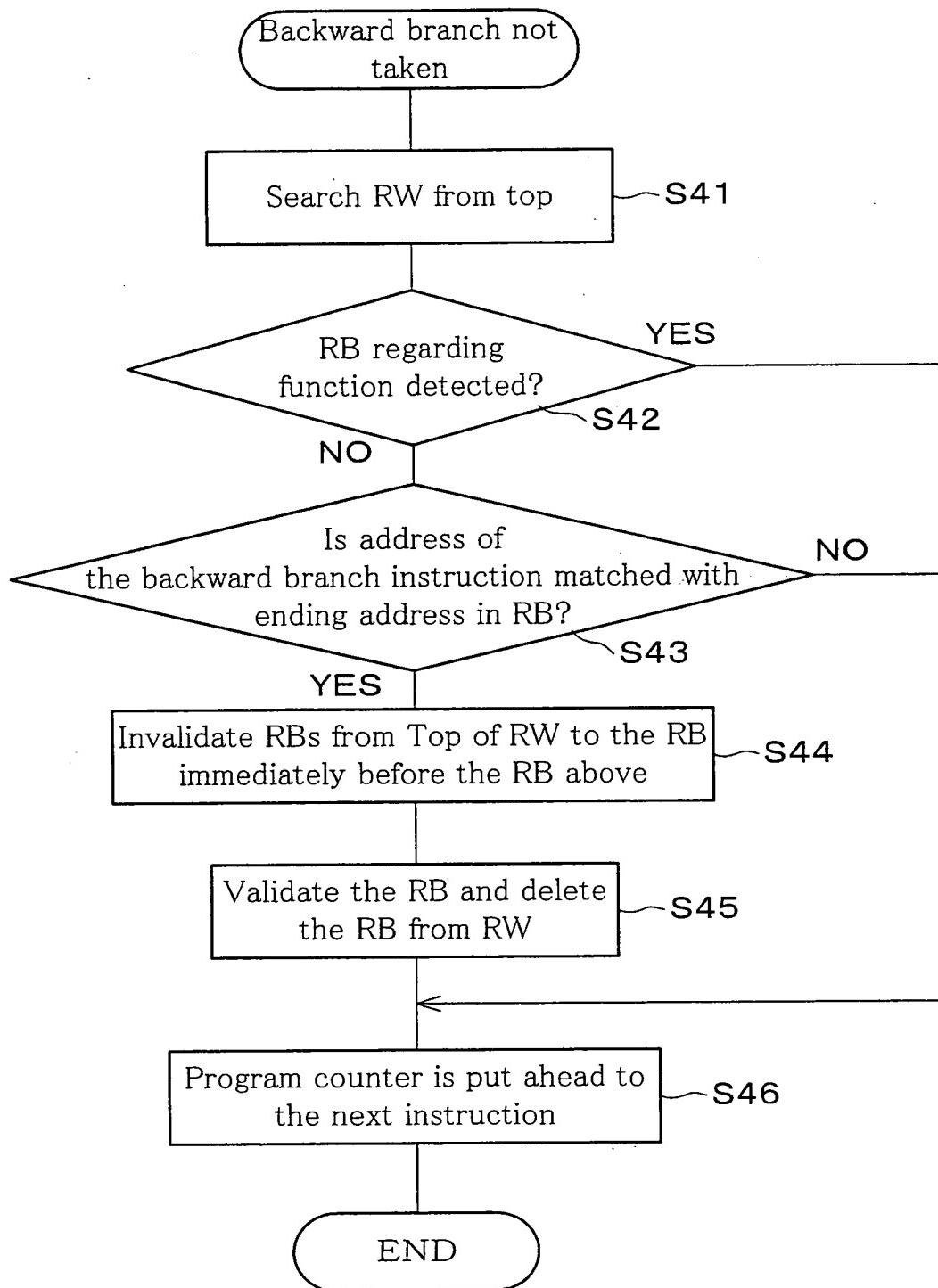


FIG. 29



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FIG. 30

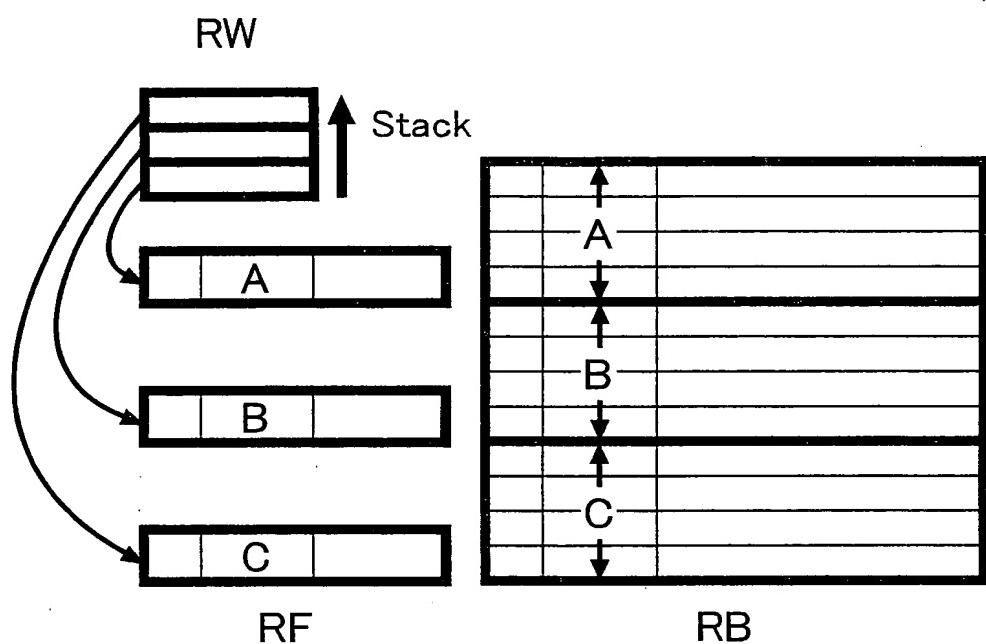
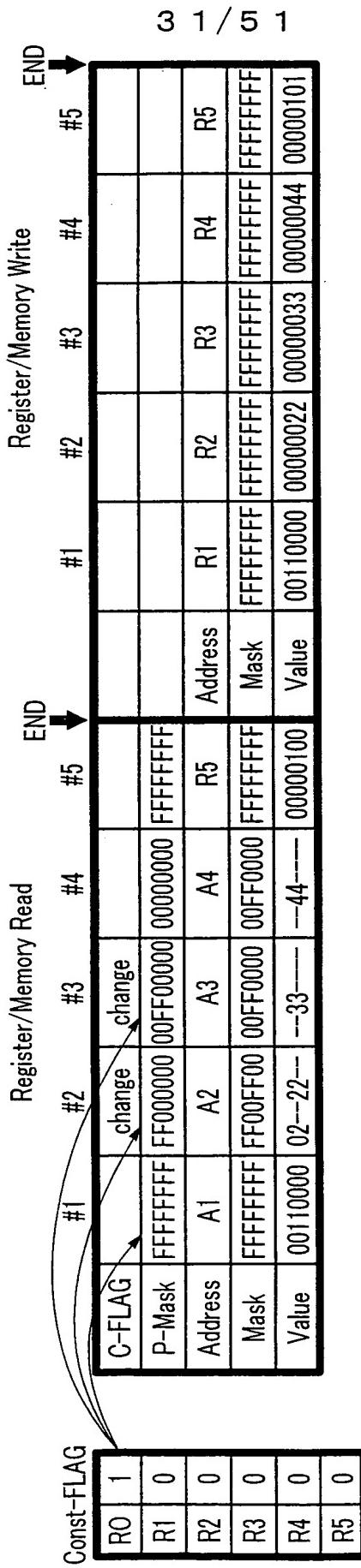


FIG. 31



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FIG. 32

Time=1

Address	A2	A3	R5		
P-Mask	FF000000	00FF0000	FFFFFFFF		
Value	02-----	--33----	00000101		

Time=2

Address	A2	A3	R5		
P-Mask	FF000000	00FF0000	FFFFFFFF		
Value	03-----	--33----	00000102		

Time=3

Address	A2	A3	R5		
P-Mask	FF000000	00FF0000	FFFFFFFF		
Value	04-----	--33----	00000103		

Time=4

Address	A2	A3	R5		
P-Mask	FF000000	00FF0000	FFFFFFFF		
Value	05-----	--55----	00000104		

Assumption of distance

↓ diff=01 ↓ diff=00 ↓ diff=01

FIG. 33

Predicted distance=1

Address	A2	R5	A2+4	A3	
Mask	FF000000	FFFFFFFF	0000FF00	00FF0000	
Value	06-----	00000105	-----26--	--55----	

Predicted distance=2

Address	A2	R5	A2+4	A3	
Mask	FF000000	FFFFFFFF	000000FF	00FF0000	
Value	07-----	00000106	-----27	--55----	

Predicted distance=3

Address	A2	R5	A2+8	A3	
Mask	FF000000	FFFFFFFF	FF000000	00FF0000	
Value	08-----	00000107	28-----	--66----	

Predicted distance=4

Address	A2	R5	A2+8	A3	
Mask	FF000000	FFFFFFFF	00FF0000	00FF0000	
Value	09-----	00000108	--29----	--66----	

FIG. 34

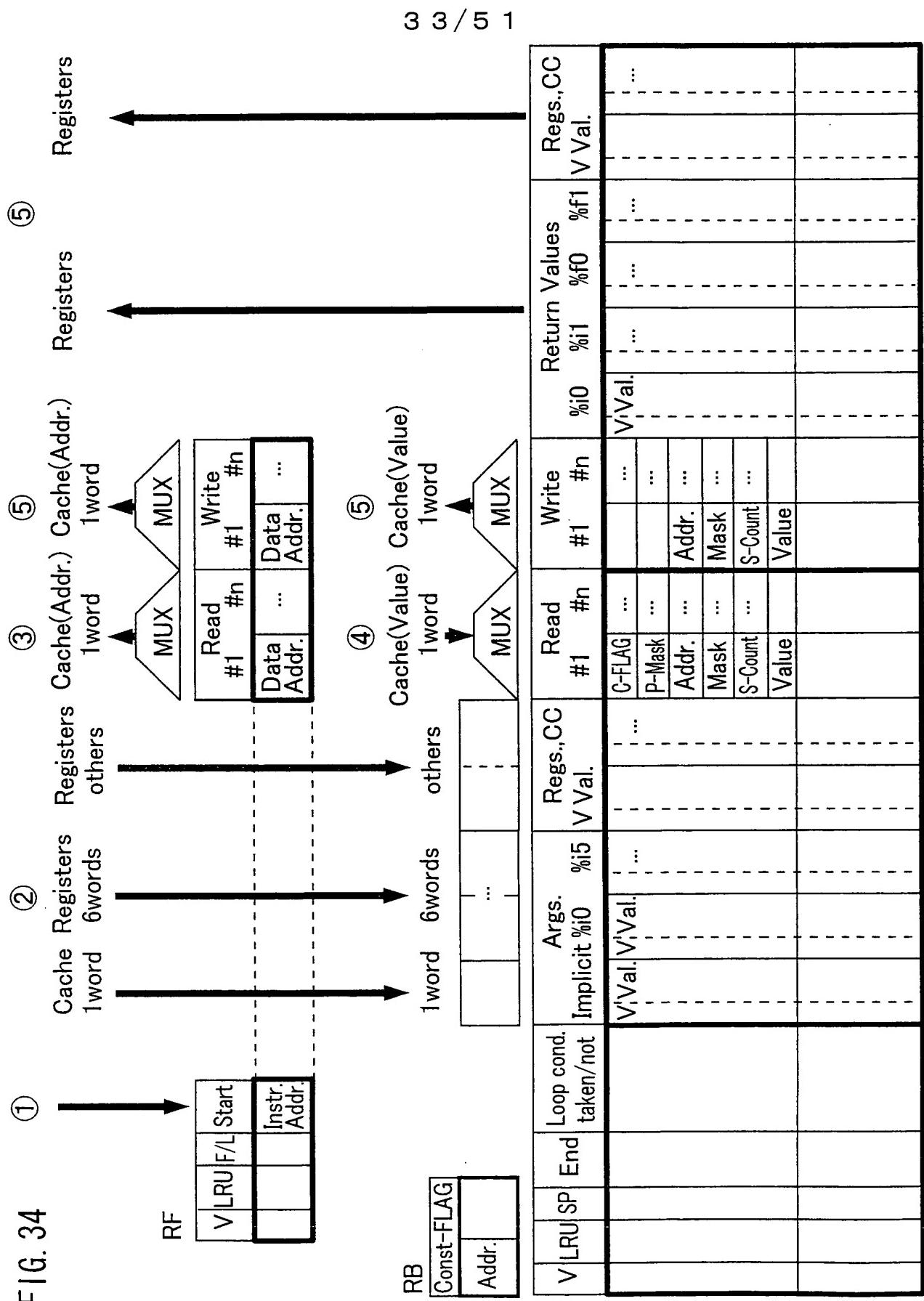
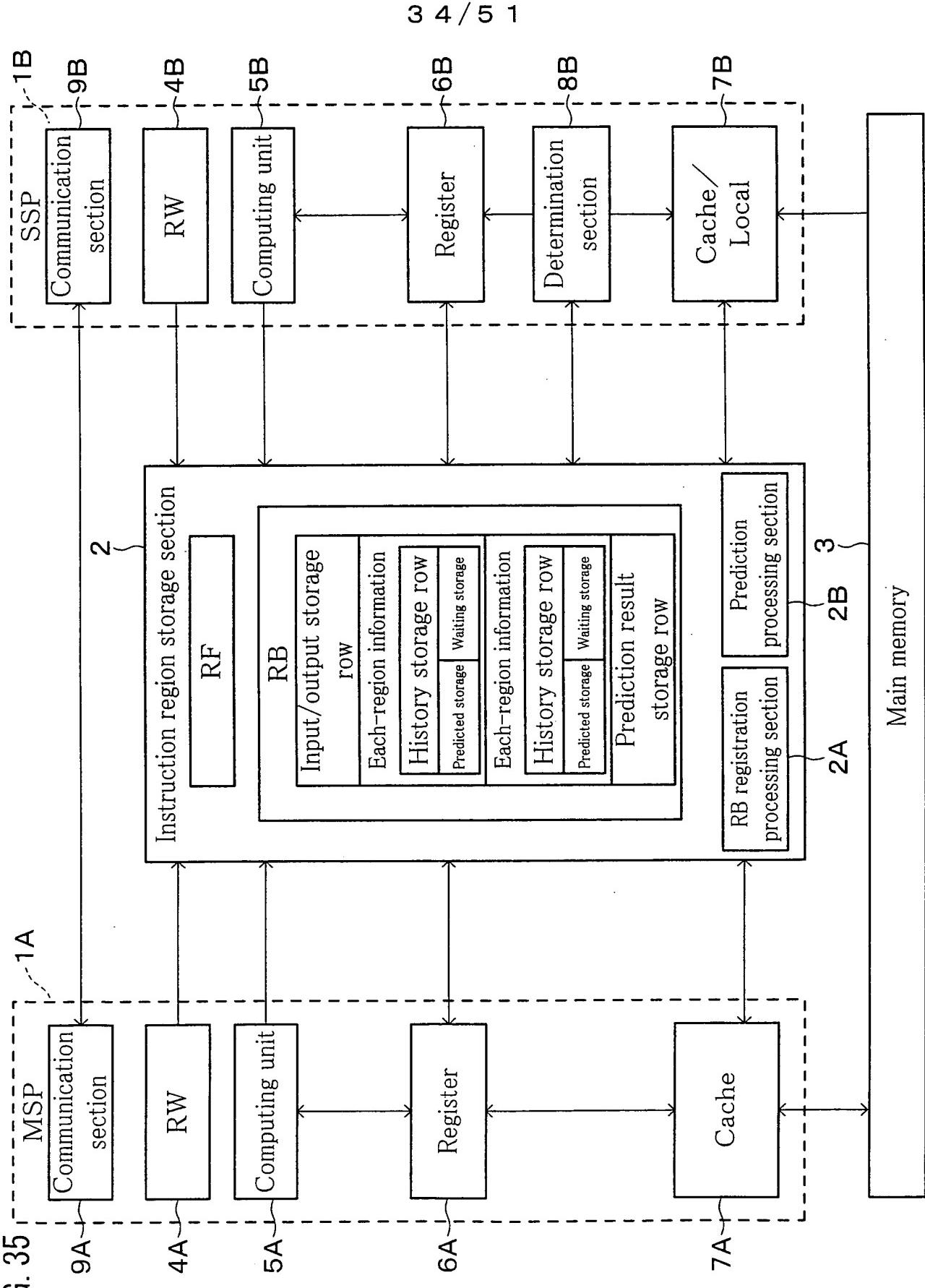


FIG. 35



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FIG. 36 (a)

```
loop:(PC=1000)
1: set A1 -> R1
2: ld (A1=R1) -> Rx ...(00010004)
3: set A2 -> R2
4: ld (A2=R2) -> Ry ...(80000000)
5: ld (A3=Rx-4) -> Rz ...(0000aaaa)
6: add Rx+4 -> Rx ... 00010008
7: st Rx ->(A1=R1) ... 00010008
8: shift Ry -> Ry ... 40000000
9: st Ry ->(A2=R2) ... 40000000
10: add Ry+Rz -> Rz ... 4000aaaa
11: st Rz ->(A4=Rx) ... 4000aaaa
12: br loop
```

FIG. 36 (b)

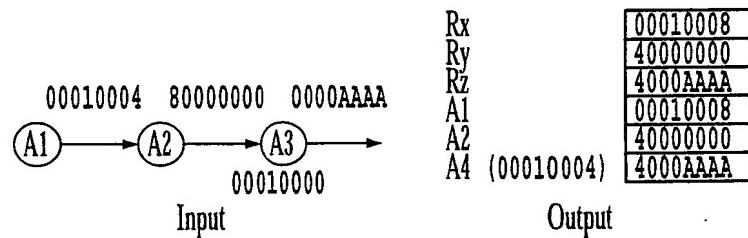


FIG. 36 (c)

```
loop:(PC=1000)
set A1 -> R1
ld (A1=R1) -> Rx ...(00010008)
set A2 -> R2
ld (A2=R2) -> Ry ...(40000000)
ld (A4=Rx-4) -> Rz ...(4000aaaa)
add Rx+4 -> Rx ... 0001000c
st Rx ->(A1=R1) ... 0001000c
shift Ry -> Ry ... 20000000
st Ry ->(A2=R2) ... 20000000
add Ry+Rz -> Rz ... 6000aaaa
st Rz ->(A5=Rx) ... 6000aaaa
br loop
```

FIG. 36 (d)

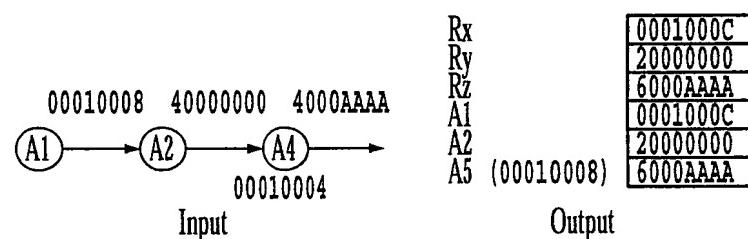
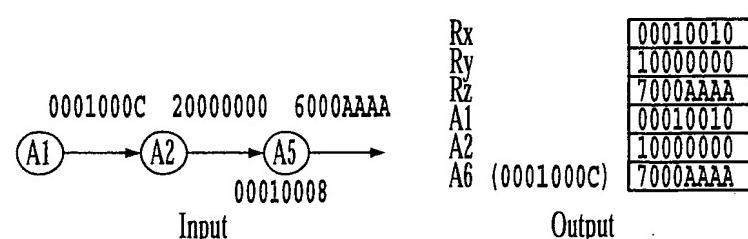


FIG. 36 (e)

```
loop:(PC=1000)
set A1 -> R1
ld (A1=R1) -> Rx ...(0001000c)
set A2 -> R2
ld (A2=R2) -> Ry ...(20000000)
ld (A5=Rx-4) -> Rz ...(6000aaaa)
add Rx+4 -> Rx ... 00010010
st Rx ->(A1=R1) ... 00010010
shift Ry -> Ry ... 10000000
st Ry ->(A2=R2) ... 10000000
add Ry+Rz -> Rz ... 7000aaaa
st Rz ->(A6=Rx) ... 7000aaaa
br loop
```

FIG. 36 (f)



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FIG. 37

Const FLAG	Register/Memory Read						Register/Memory Write					
	#1	#2	#3	#4	#5	#6	#1	#2	#3	#4	#5	#6
R1 1	C-FLAG	change										
R2 1	P-Mask	FFFFFFF	FFFFFFF	00000000								
RX 0	Address	A1	A2	A3	Address	Rx	RY	Rz	A1	A2	A3	A4
RY 0	Mask	FFFFFFF	FFFFFFF	FFFFFFF	Mask	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF
RZ 0	Value	00010004	80000000	0000AAAA	Value	00010008	40000000	4000AAAAA	00010008	40000000	4000AAAA	

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FIG. 38(a)

Address	A1	A2	
P-Mask	FFFFFFF	FFFFFFF	
Value	00010004	80000000	

↓ diff=04 ↓ diff=-4

Address	A1	A2	
P-Mask	FFFFFFF	FFFFFFF	
Value	00010008	40000000	

↓ diff=04 ↓ diff=-2

Address	A1	A2	
P-Mask	FFFFFFF	FFFFFFF	
Value	0001000C	20000000	

↓ diff=04 ↓ diff=-1

Address	A1	A2	
P-Mask	FFFFFFF	FFFFFFF	
Value	00010010	10000000	

Assumption of distance ↓ diff=04 ↓ diff=?

First loop

Second loop

Third loop

Fourth loop

FIG. 38(b)

Predicted value storing region Waiting-required address storage region

Address	A1	A2	A7
Mask	FFFFFFF	FFFFFFF	FFFFFFF
Value	00010014	10000000	????????

Fifth loop
Predicted distance is 1 = allocation to MSP

Address	A1	A2	A8
Mask	FFFFFFF	FFFFFFF	FFFFFFF
Value	00010018	10000000	????????

Sixth loop
Predicted distance is 2 = allocation to SSP#1

Address	A1	A2	A9
Mask	FFFFFFF	FFFFFFF	FFFFFFF
Value	0001001C	10000000	????????

Seventh loop
Predicted distance is 3 = allocation to SSP#2

Address	A1	A2	A10
Mask	FFFFFFF	FFFFFFF	FFFFFFF
Value	00010020	10000000	????????

Eighth loop
Predicted distance is 4 = allocation to SSP#3

FIG. 39

loop:(PC=1000)

```

set A1 -> R1
ld (A1=R1) -> Rx ...(00010004)
set A2 -> R2
ld (A2=R2) -> Ry ...(80000000)
ld (A3=Rx-4) -> Rz ...(0000aaaa)
add Rx+4 -> Rx ...00010008
st Rx ->(A1=R1) ... 00010008
shift Ry -> Ry ... 40000000
st Ry ->(A2=R2) ... 40000000
add Ry+Rz -> Rz ... 4000aaaa
st Rz ->(A4=Rx) ... 4000aaaa
br loop

```

loop:(PC=1000)

```

set A1 -> R1
ld (A1=R1) -> Rx ...(00010008)
set A2 -> R2
ld (A2=R2) -> Ry ...(80000000)
ld (A4=Rx-4) -> Rz ...(????????)
add Rx+4 -> Rx ... 0001000c
st Rx ->(A1=R1) ... 0001000c
shift Ry -> Ry ... 40000000
st Ry ->(A2=R2) ... 40000000
add Ry+Rz -> Rz ... 4000?????
st Rz ->(A4=Rx) ... 4000?????
br loop

```

loop:(PC=1000)

```

set A1 -> R1
ld (A1=R1) -> Rx ...(0001000c)
set A2 -> R2
ld (A2=R2) -> Ry ...(80000000)
ld (A5=Rx-4) -> Rz ...(????????)
add Rx+4 -> Rx ... 00010010
st Rx ->(A1=R1) ... 00010010
shift Ry -> Ry ... 40000000
st Ry ->(A2=R2) ... 40000000
add Ry+Rz -> Rz ... 4000?????
st Rz ->(A5=Rx) ... 4000?????
br loop

```

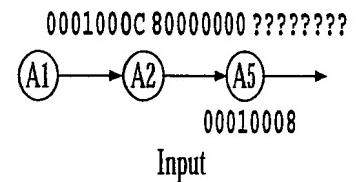
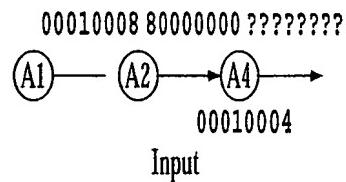
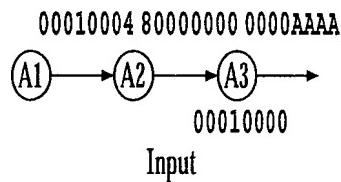


FIG. 40(a)

Register/Memory Read		Register/Memory Write						
#1	#2	#3	#1	#2	#3	#4	#5	#6
C-FLAG	Change	Change						
P-Mask	FFFFFFFFFF	FFFFFFFFFF	00000000	Address	Rx	RY	Rz	A1
Address	A1	A2	A3	Mask	FFFFFFFF	FFFFFFF	FFFFFFF	A2
Mask	FFFFFFFFFF	FFFFFFFFFF	FFFFFFFFFF	S-Count				A4
Value	00010004	80000000	0000AAAA	Value	00010008	40000000	40000000	40000000

FIG. 40(b)

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FIG. 41(a)

First loop

Address	A1	A2	A3
P-Mask	FFFFFFF	FFFFFFF	0000000
S-Count	0001	0001	0001
Value	00010004	80000000	

Second loop

Address	A1	A2	A4
P-Mask	FFFFFFF	FFFFFFF	00000000
S-Count	0001	0001	0001
Value	00010008	40000000	

Third loop

Address	A1	A2	A5
P-Mask	FFFFFFF	FFFFFFF	00000000
S-Count	0001	0001	0001
Value	0001000C	20000000	

Fourth loop

Address	A1	A2	A6
P-Mask	FFFFFFF	FFFFFFF	00000000
S-Count	0001	0001	0001
Value	00010010	10000000	

Assumption of distance diff=04 diff=??

FIG. 41(b)

Predicted value storing region Waiting required address storage region

Fifth loop
Predicted distance is 1 = allocation to MSP

Address	A1	A2	A7
Mask	FFFFFFF	FFFFFFF	FFFFFFF
S-Count		0000	0001
Value	00010014	WAIT	WAIT

Sixth loop
Predicted distance is 2 = allocation to SSP#1

Address	A1	A2	A8
Mask	FFFFFFF	FFFFFFF	FFFFFFF
S-Count		0001	0001
Value	00010018	WAIT	WAIT

Seventh loop
Predicted distance is 3 = allocation to SSP#2

Address	A1	A2	A9
Mask	FFFFFFF	FFFFFFF	FFFFFFF
S-Count		0002	0001
Value	0001001C	WAIT	WAIT

Eighth loop
Predicted distance is 4 = allocation to SSP#3

Address	A1	A2	A10
Mask	FFFFFFF	FFFFFFF	FFFFFFF
S-Count		0003	0001
Value	00010020	WAIT	WAIT

FIG. 42 Fifth loop (MSP)

Sixth loop (SSP#1)				
Address	A1	A2	A8	
Mask	FFFFFFF	FFFFFFF	FFFFFFF	
SCount		0001	0001	
Value	00010018	WAIT	WAIT	

loop ^(PC=1000)			
set	A1	-> R1	
ld	(A1=R1)	-> Rx	..((00010014))
set	A2	-> R2	
ld	(A2=R2)	-> Ry	..((08000000))
ld	(A7=Rx-4)	-> Rz	..((7800aaaa))
add	Rx+4	-> Rx	..(00010018)
st	Rx	->(A1=R1)	..(00010018)
shift	Ry	-> Ry	..(04000000)
st	Ry	->(A2=R2)	..(04000000)
add	Ry+Rz	-> Rz	..(7c0aaaaa)
st	Rz	->(A8=Rx..)	..(7c0aaaaa)
			loop
			br

Sixth loop (SSP#1) Seventh loop (SSP#2)

Address	A1	A2	A8	Address	A1	A2	A9
Mask	FFFFFFF	FFFFFFF	FFFFFFF	Mask	FFFFFFF	FFFFFFF	FFFFFFF
S-Count		0001		S-Count			0002
Value	00010018	WAIT	WAIT	Value	0001001C	WAIT	WAIT

loop: {PC=1000}				
Address	A1	A2	A8	
Mask	FFFFFF	FFFFFF	FFFF	FFFF
S-Count			0000	0000
Value	00010018	04000000	7C00AAAA	

ld	$(A2=R2)$	$\rightarrow Ry$	"	(04000000)
ld	$(A8-Rx-4)$	$\rightarrow Rz$	"	$(7cd0aaaa)$
add	$Rx+4$	$\rightarrow Rx$	"	$0001001c$
st	Rx	$\rightarrow (A1=R1)$	"	$0001001c$
shift	Ry	$\rightarrow Ry$	"	02000000
st	Ry	$\rightarrow (A2=R2)$	"	02000000
add	$Ry+Rz$	$\rightarrow Rz$	"	$7e00aaaa$
st	Rz	$\rightarrow (A9=Rx)$	"	$7e00aaaa$

Output

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0001001C 02000000 7E00AAAA
A1
A2
A3
Rx 00010020
Ry 01000000
Rz 7F00AAAA
A1 0001_0020
A2 01000000
A3 7F00AAAA

FIG. 43

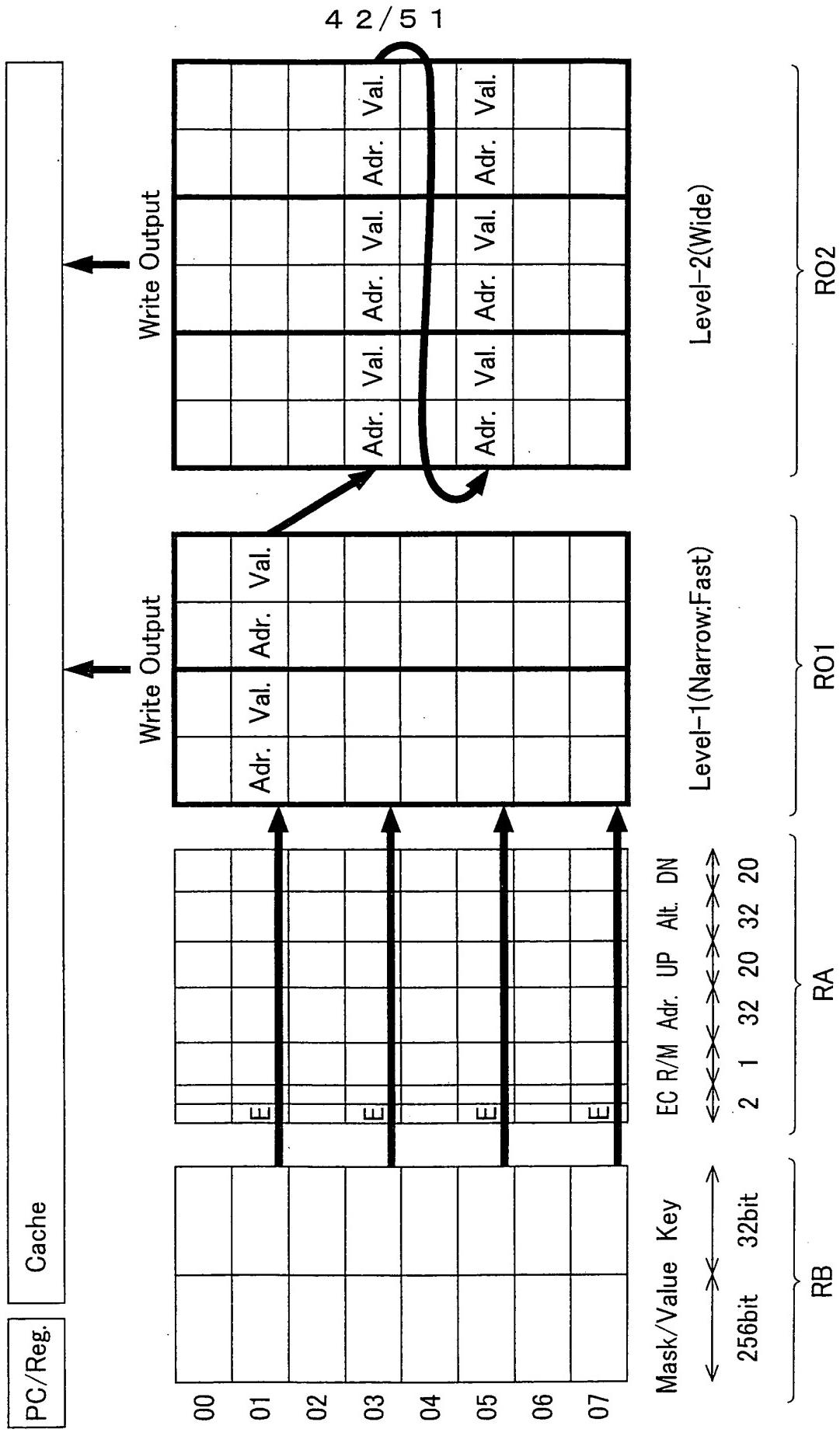


FIG. 44

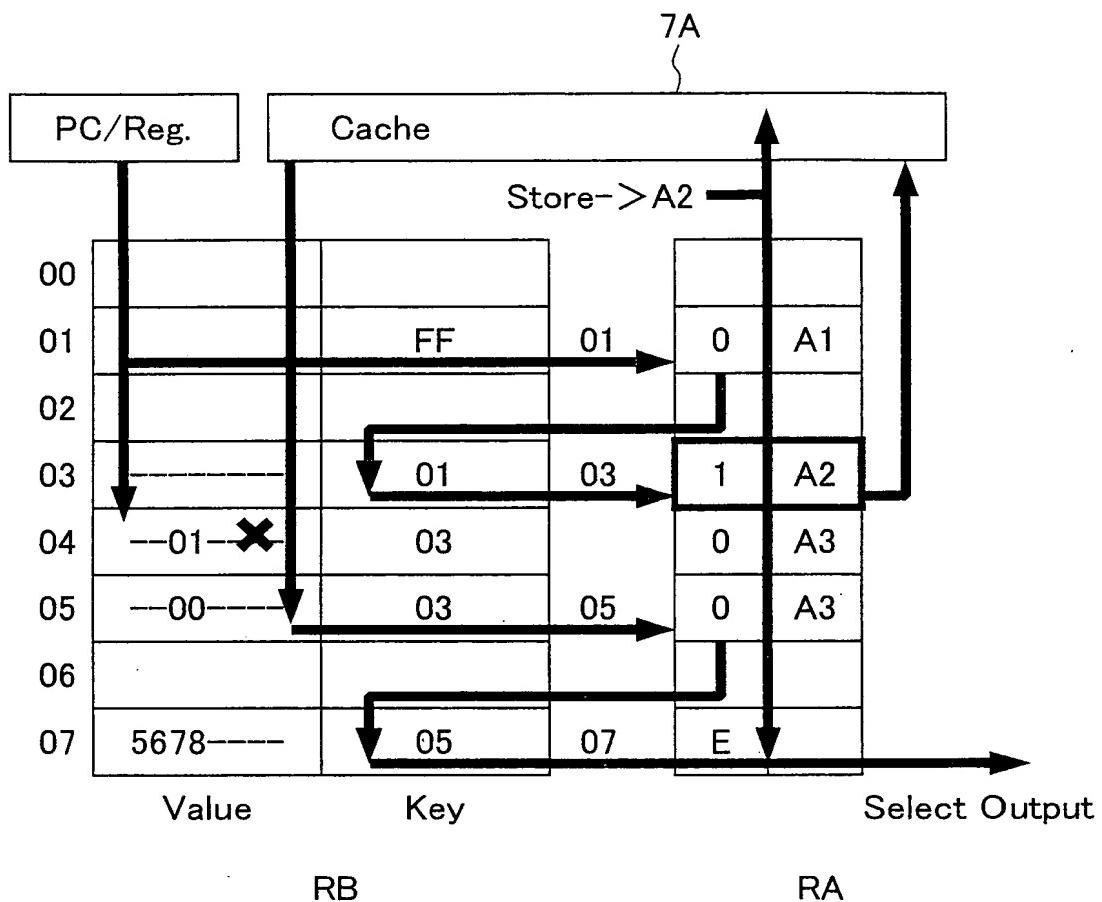
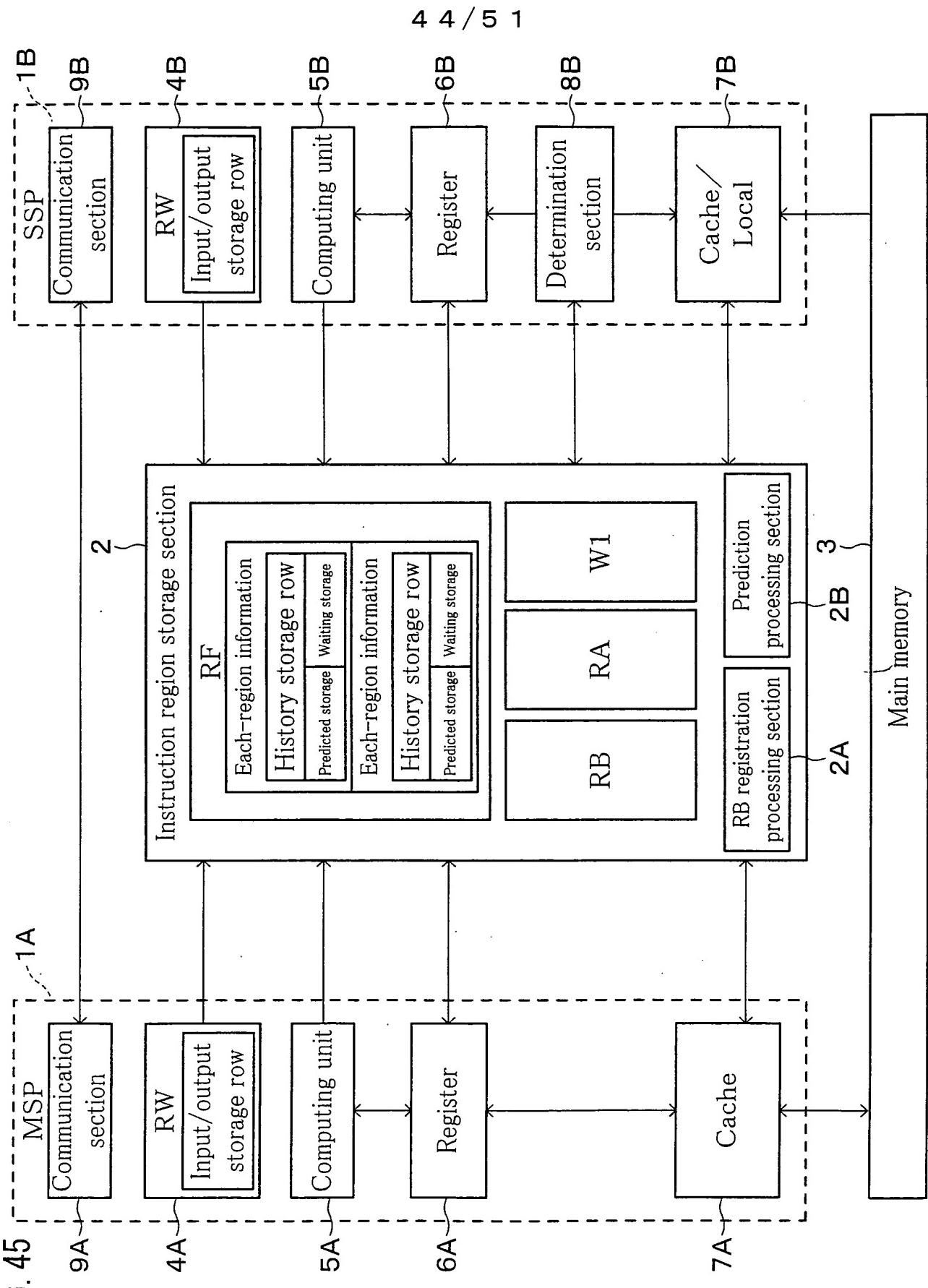


FIG. 45



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FIG. 46 (a)

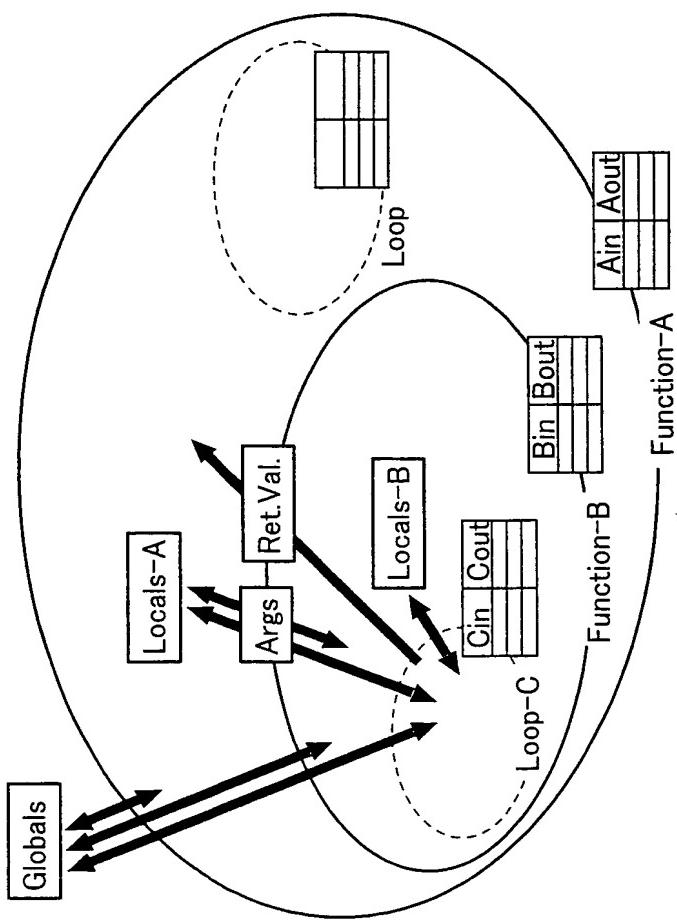


FIG. 46 (b)

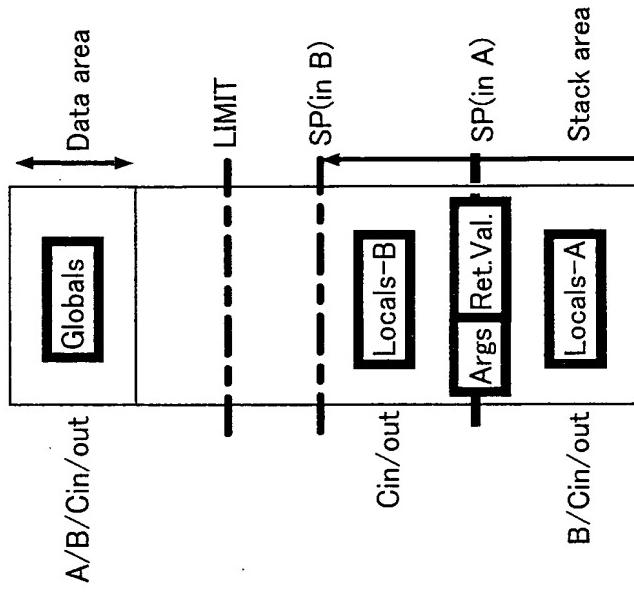
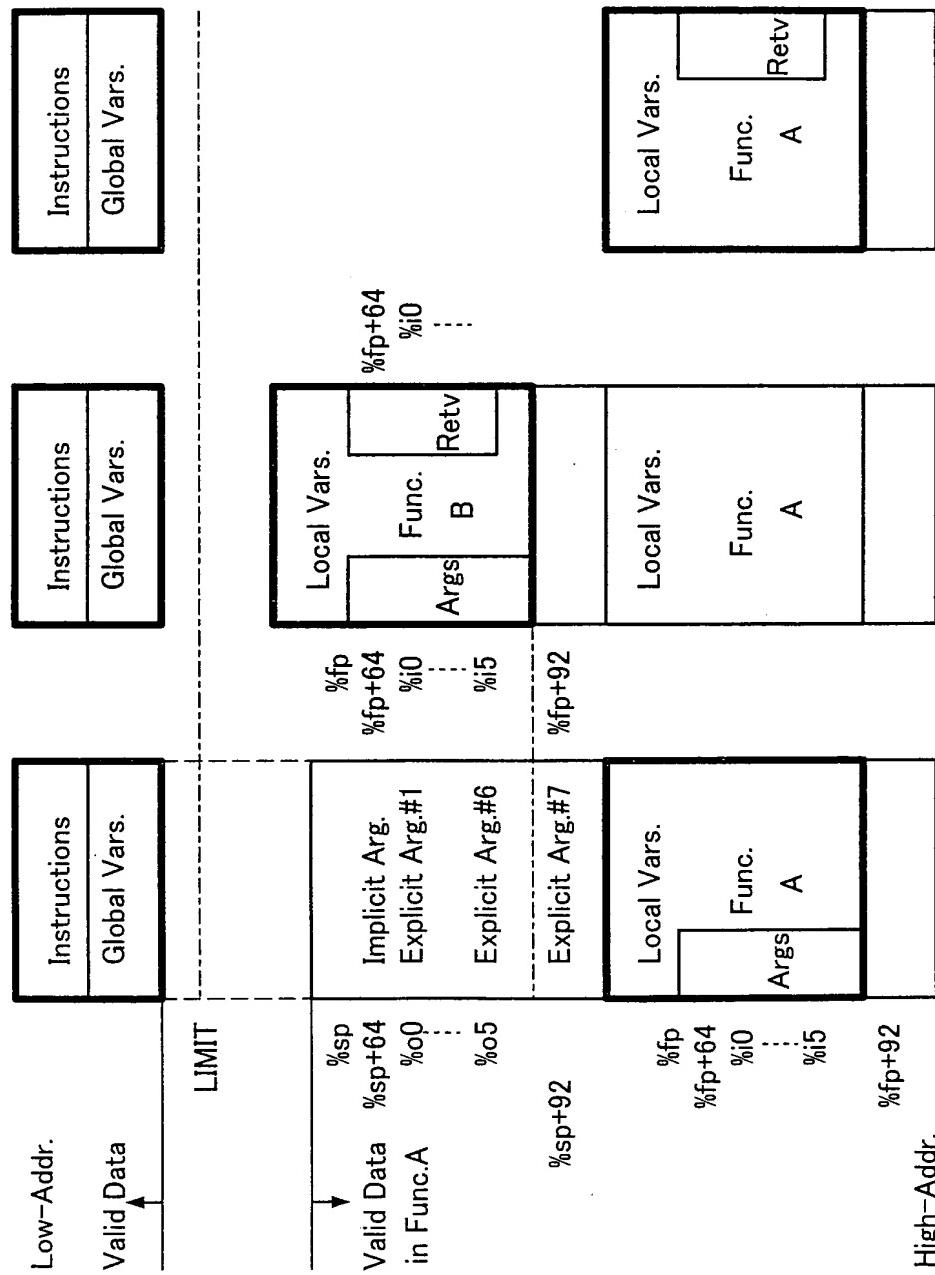


FIG. 47

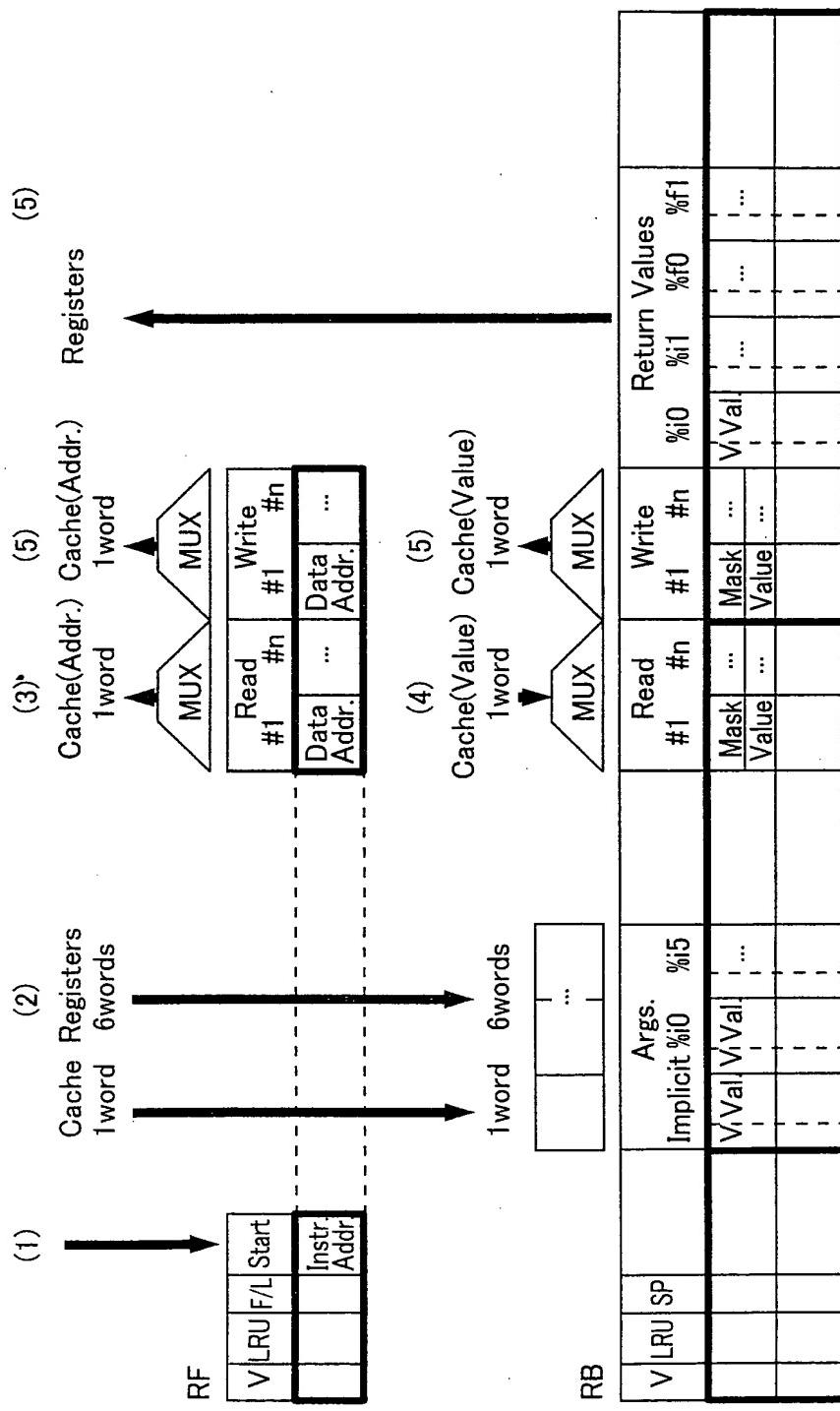


(a) Call A.

(b) Call/Return B.

(c) Return A.

FIG. 48

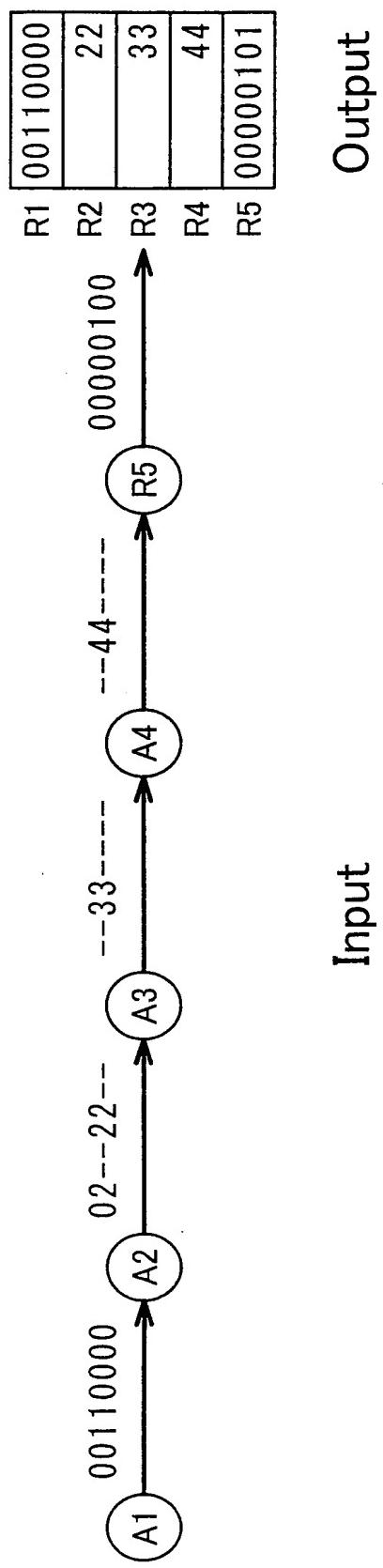


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FIG. 49

PC:1000
set A1->R0
ld (R0)->R1
set A2->R0
ldb (R0)->R2
ldb (A2+R2)->R2
set A3->R0
ldb (R0)->R3
ldb (A4=R1+R2)->R4
add R5+1->R5

FIG. 50



R1	00110000
R2	22
R3	33
R4	44
R5	00000101

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FIG. 51

5 1 / 5 1

FIG. 52

Address	A1	A2	A3	A4	R5	
Mask	FFFFFFFF	FF00FF00	00FF0000	00FF0000	FFFFFFFF	Time=1
Value	00110000	02--22--	--33--	--44--	00000101	

↓ ↓ ↓ ↓ ↓

Address	A1	A2	A3	A4	R5	
Mask	FFFFFFFF	FF0000FF	00FF0000	00FF0000	FFFFFFFF	Time=2
Value	00110000	03---23	--33--	--44--	00000102	

↓ ↓ ↓ ↓ ↓

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	FF000000	00FF0000	00FF0000	Time=3
Value	00110000	04-----	24-----	--33--	--44--	

↓ ↓ ↓ ↓ ↓

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	00FF0000	00FF0000	00FF0000	Time=4
Value	00110000	05-----	--25--	--55--	--44--	

↓ ↓ ↓ ↓ ↓

Assumption of distance ↓ ↓ ↓ ↓ ↓

diff=00 diff=01 diff=00 diff=22 diff=00

FIG. 53

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	00FF0000	00FF0000	00FF0000	Predicted distance=1
Value	00110000	06-----	--25--	--77--	--44--	

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	00FF0000	00FF0000	00FF0000	Predicted distance=2
Value	00110000	07-----	--25--	--99--	--44--	

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	00FF0000	00FF0000	00FF0000	Predicted distance=3
Value	00110000	08-----	--25--	--BB--	--44--	

Address	A1	A2	A2+4	A3	A4	
Mask	FFFFFFFF	FF000000	00FF0000	00FF0000	00FF0000	Predicted distance=4
Value	00110000	09-----	--25--	--DD--	--44--	